JVC

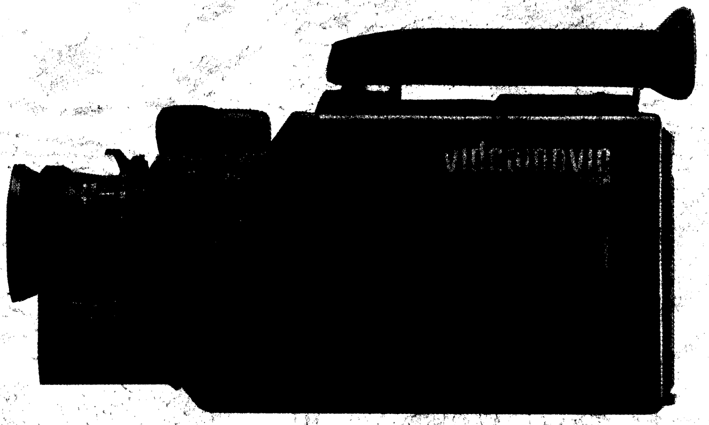
SERVICE MANUAL

VHS VIDEO MOVIE

GR-60EG/EK

VHS C PAL

HQ High Quality



SPECIFICATIONS

Format	: VHS standard
Power source	: DC 9.6 V ⎓
Power consumption	: 8.0 W
Signal system	: PAL
Recording system	: Luminance: FM recording Colour: Converted sub-carrier direct recording Conforms to VHS standard
Cassette	: VHS-C cassette
Tape speed	: 23.39 mm/sec
Recording time Max.	: 30 minutes (with EC-30 cassette)
VIDEO	
Output	: 1 Vp-p, 75 ohms, unbalance (via AV OUT connector)
S/N ratio	: More than 42 dB (with Rohde & Schwarz noise meter)
AUDIO	
Output	: –6 dBs, 1 k-ohm (via AV OUT connector)
Microphone input	: –68 dBs, high impedance, unbalanced
Pickup	: 1/2"-format CCD
Minimum required illumination	: 10 lux (at F/1.4)
Illumination range	: 10 – 100,000 lux
Lens	: F/1.4 ~2.0, f = 9–54 mm, 6: 1 two-speed power zoom lens with auto iris control and macro position, filter diameter 49 mm
Viewfinder	: Electronic viewfinder with 0.6" black/white CRT
Selectable high-speed shutter	: 1/250, 1/500, 1/1000 second
Colour temperature switching	: Switchable (3,200 K/4,500 K/5,500 K)
White balance adjustment	: Full-auto/preset standard
Operating temperature	: 0° C to +40°C
Operating humidity	: 35% to 80%
Storage temperature	: –20°C to +50°C
Weight	: 1.2 kg (with viewfinder)
Dimensions	: 111(W) x 149(H) x 244(D) mm (incl. viewfinder)

AA-V5EG SPECIFICATIONS

Power requirement	: AC 110 – 240 V∿, 50/60 Hz
Power consumption	: 21 watts
Output	: DC 14 V ⎓ 1.1 A (Charge) DC 9.6 V ⎓ 1.2 A (VideoMovie)
Charging system	: Constant current, peak detection, timer controlled
Dimensions	: 68(W) x 38(H) x 150(D) mm
Weight	: Approx. 380 g

C-P5U SPECIFICATIONS

Type	: VHS cassette adapter
Dimensions	: 188(W) x 25(H) x 104(D) mm
Weight	: 240 g
Accessory	: "R6"-size battery x 1

RF-V3E SPECIFICATIONS

Output channel	: UHF channel 32 – 40 (adjustable)
Initial channel setting	: UHF 36
Power source	: DC 8 V 20 mA (from VideoMovie)
Dimensions	: 52(W) x 80(H) x 24(D) mm excl. cable
Cable lenght	: 2.5 m
Weight	: Approx. 160 g

Provided accessories:

AC power adapter/battery charger	AA-V5EG
Cassette adapter	C-P5U
Cassette tape	EC-30
Battery pack	BN-V6GU
RF unit	RF-V3E
Shoulder strap	
Electric viewfinder	
Lens cap	
Lens hood	
Battery for clock operation	
Title easel	

For optional accessories, refer to pages 31 and 32.

Design and specifications subject to change without notice.

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

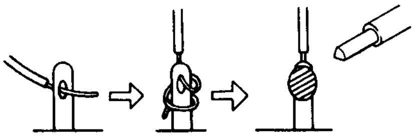


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

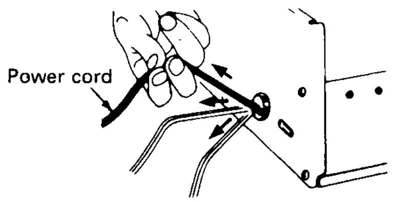


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

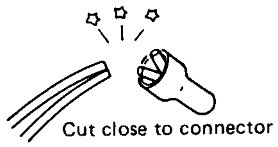


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

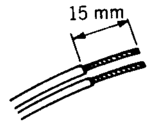


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

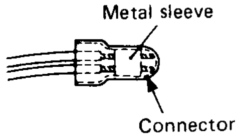


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

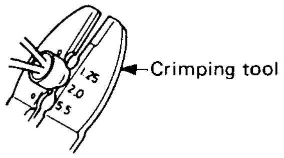


Fig. 6

(5) Check the four points noted in Fig. 7.

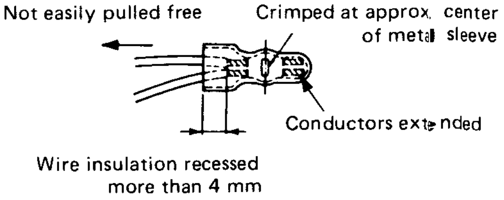

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

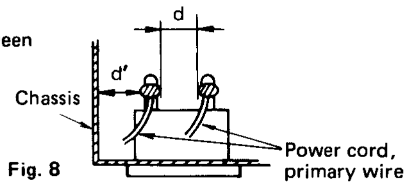


Fig. 8

4. **Leakage current test**
Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
Measuring Method: (Power ON)
Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

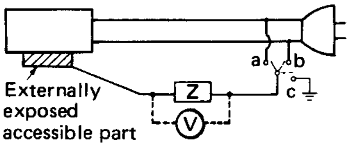


Fig. 9

5. **Grounding (Class I model only)**
Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
Measuring Method:
Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

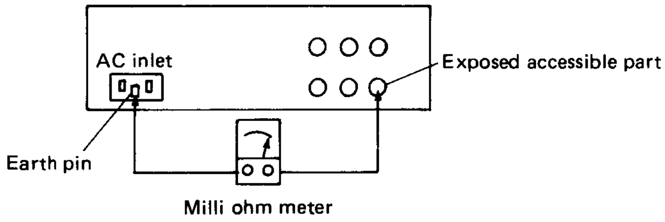


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INSTRUCTIONS

MANUEL D'INSTRUCTIONS BEDIENUNGSANLEITUNG MANUAL DE INSTRUCCIONES
GEBRUIKSAANWIJZING BRUKSANVISNING MANUALE DI ISTRUZIONI

videomovie

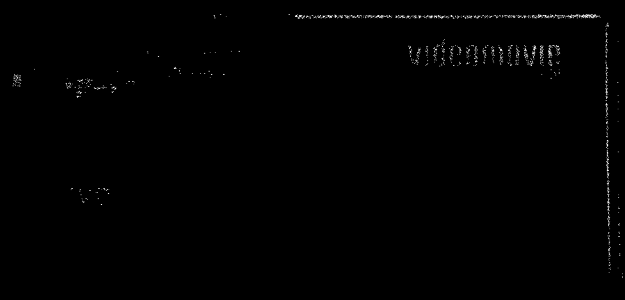
VHS C

CAMERA-RECORDER/PLAYER

HQ High Quality

GR-60

Specifically for the GR-60E/AA V5EG



CCD
Charge Coupled Device

AF
AUTO FOCUS

JVC

[illegible]
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KAMERA-RECORDER GR-60E
[illegible]
CAMERA GRABADORE GR-60E
[illegible]

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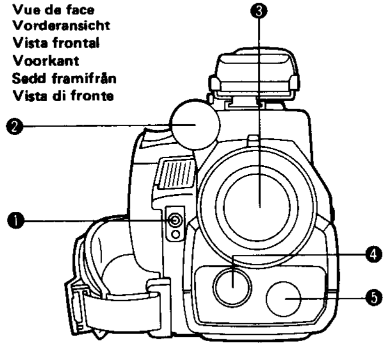
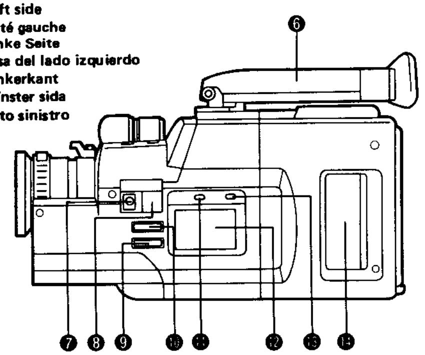
[illegible]
KAMERA-BANDSPELARE GR-60E
[illegible]
TELECAMERA REGISTRATORE GR-60E
[illegible]

[illegible]

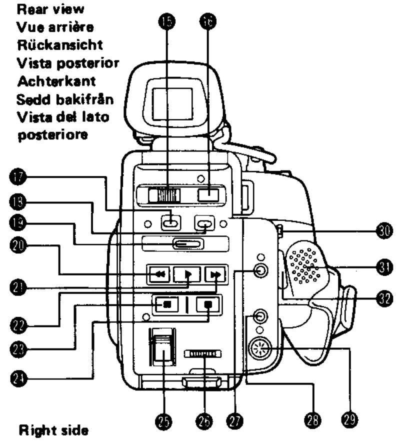
Front view
Vue de face
Vorderansicht
Vista frontal
Voorkant
Sedd framifrån
Vista di fronte



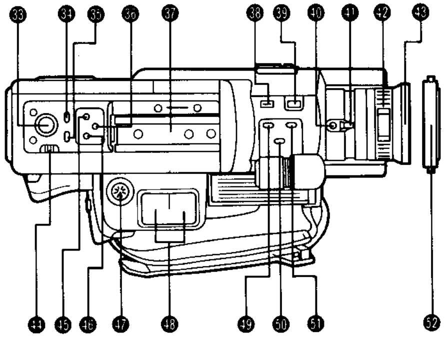
Left side
Côté gauche
Linke Seite
Visa del lado izquierdo
Linkerkant
Vänster sida
Lato sinistro



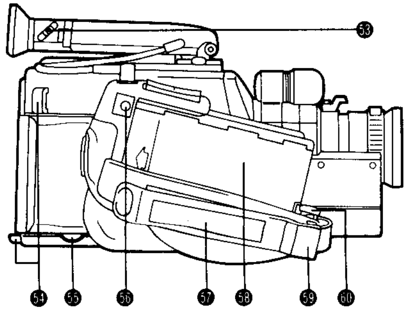
Rear view
Vue arrière
Rückansicht
Vista posterior
Achterkant
Sedd bakifrån
Vista del lato posteriore



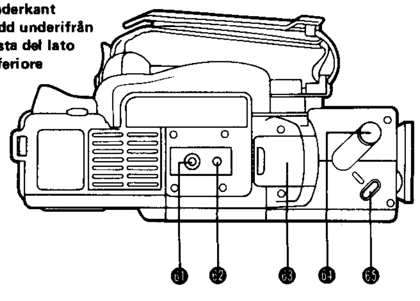
Top view
Vue de dessus
Draufsicht
Vista superior
Bovenkant
Sedd ovanifrån
Vista del lato superiore



Right side
Côté doit
Rechte Seite
Vista del lado derecho
Rechterkant
Höger sida
Lato destro



Bottom view
Vue de dessous
Unteransicht
Vista inferior
Onderkant
Sedd underifrån
Vista del lato inferiore



SAFETY PRECAUTIONS

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

This equipment should be used with DC 9.6 V ⎓ only.

CAUTION:

To prevent electric shocks and fire hazards, do NOT use any other power source.

The AA-V5EG AC Power Adapter/Battery Charger should be used with 110 – 240 V∿, 50/60 Hz only.

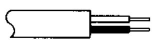
Caution:

To prevent electric shocks and fire hazards, do NOT use any other power source.

IMPORTANT (In the United Kingdom) Mains Supply (240 V∿, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with following code:



If these colours do not correspond with the terminal identifications of your plug, connect as follows:

Blue wire to terminal coded N (Neutral) or coloured black.

Brown wire to terminal coded L (Live) or coloured Red.

If in doubt – consult a competent electrician.

Note

We recommend that you should disconnect the AC cord from the outlet.

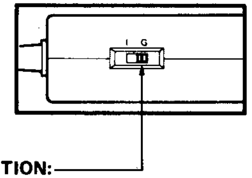
- VideoMovie is designed exclusively for the VHS-C video cassette. Only cassettes marked VHS-C can be used with this unit.
- *HQ VHS is compatible with existing VHS equipment.*

Warning on lithium battery

The battery used in this device may present a fire or chemical burn hazard if mesused. Do not recharge, disassemble, heat above 100°C or incinerate.

Replace battery with Panasonic (Matsushita Electric) CR 2025; use of another battery may present a risk of fire or explosion.

- Dispose of used battery promptly.
- Keep away from children.
- Do not disassemble and do not dispose of in fire.



ATTENTION:

The system select switch on the side of the provided RF-V3E RF unit has been set to G (Continental PAL, 5.5 MHz).

CAUTION:

To prevent shock, do not open the cabinet. No user serviceable parts inside. Refer servicing to qualified personnel.

NOTES:

- The rating plate (serial number plate) and safety caution of the main unit are on its bottom.
- The rating plate (serial number plate) of the viewfinder is on its bottom.
- The rating plate (serial number plate) of the AC power adapter/battery charger is on its bottom.

The provided viewfinder is the VF-V77E(S). Do not use any other viewfinder with athe GR-60E.

This equipment has been produced to comply with Directive number 82/499/EEC.

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PRECAUTIONS

For safety, strictly observe the following instructions.

- Do not open the cabinet.
- Prevent inflammables, water and metallic objects from entering the unit.
- Do not disassemble or modify the unit.
- Do not use the unit when there is lightning in the vicinity. Disconnect the power cable of connected equipment.

Avoid using the unit under the following conditions:

- Places subject to excessive humidity or dust.
- Near appliances generating strong magnetic or electric fields (speakers, broadcasting antennas, etc.).
- Places subject to soot or steam such as near a cooking stove.
- Places subject to excessive shock or vibration.
- Near a television set (rolling pictures or howling might result).
- Extremely hot places.

Do not expose the unit to high temperatures over 50°C for long periods.

If the unit should be subjected to direct sunlight, or left in a closed car in summer, or placed near a heater, the CCD and the auto-focus sensor may deteriorate and the cabinet may become deformed. Furthermore, this also may cause the transistors and other electronic and mechanical parts to malfunction. Remember the following:

- Do not leave the unit in places of over 50°C.
- Do not use the unit in places of over 40°C.
- Do not use the unit in places of below 0°C.
- Protect the unit from excessively dry or humid conditions (below 35 % or above 80 % humidity).
- For long storage, select a place between -10°C and 30°C.

Take special care for protection of the unit.

- Do not allow the unit to become wet.
- Do not leave the unit in closed cars on hot summer days.
- Take special care not to drop the unit or strike it against hard objects. Protect from shocks during transportation.

Moisture condensation disenables use of the unit.

- You have observed that pouring a cold liquid into a glass will cause drops of water to from on the glass's outer surface. This same phenomenon occurs on the head drum of a VideoMovie when it is moved from a cool place to a warm place, after heating a cold room, under extremely humid conditions or in a place directly subjected to the cool air from an air conditioner.
- Moisture on the head drum can cause severe damage to the video tape, and can lead to internal damage to the VideoMovie itself.
- If moisture condensation occurs on the head drum, a condensation warning appears above the counter display and the unit enters the Stop mode, unable to function. In such a case wait for a few hours until the indicator disappears.

Make it a rule to observe the following instructions.

- Do not remove the battery pack or disconnect other power supply units during recording or playback before pressing the POWER switch to OFF. If not observed, this will cause tape damage.
- When the unit is not in use, remove the battery pack.

Keep the lens and viewfinder eyepiece always clean.

- When the lens if dirty or dusty, blow it off first and then gently wipe with a soft brush or lens cleaning paper.
- The lens is likely to become moldy if left dirty.

Serious malfunctioning

If malfunctioning occurs, stop using the unit immediately and consult your local JVC dealer.

Be careful not to damage the CCD and auto-focus sensor.

- Do not keep the lens directed at extremely bright objects such as the sun or other light sources for long periods. Although the CCD is less susceptible to such burn than a tube would be, caution should be exercised when using this unit. Most importantly, the lens should be capped except while actually shooting.
- If the aperture is left open, even while the camera is not being powered, the CCD may be damaged.
- Do not direct the eyepiece of the viewfinder at the sun.

Auto-focus information.

- Do not touch the focus ring while the auto-focus mechanism is in operation as this could damage the auto-focus mechanism.
- When a filter or a special-effect lens is to be attached to the end of the lens, be sure to turn power off or switch from the Auto-focus mode to the Manual mode. NEVER attempt to attach a filter or lens while the auto-focus mechanism is operating as this will result in malfunctioning. (If a teleconversion or wide-angle conversion lens is attached, the Auto-focus mode cannot be used.)

Handle the unit carefully.

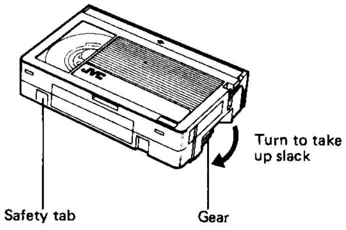
- Protect the microphone from excessive shocks.
- Do not carry the unit by holding it only by the viewfinder.

Maintenance

- When the cabinet is dusty, clean by gently wiping with a soft cloth.
- Avoid the use of strong cleaning agents such as benzine or alcohol as they may damage the cabinet.
- Cleaning should be done only after the battery pack has been removed or other power units have been disconnected.

VIDEO CASSETTES

- ●The GR-60E employs only compact video cassettes carrying the VHS-C mark.
- ●Recording onto prerecorded tapes automatically erases the previously recorded video and audio signals.
- ●An inverted cassette cannot be inserted.
- ●Do not load and unlaod the cassette repeatedly without allowing the tape to run at all. This will slacken the tape and thereby damage it.
- ●Make certain befor loading the cassette that the tape is not slack. If there is any slack, turn the gear on the cassette in the direction of the arrow to take up slack.
- ●The cassette is equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording is impossible. If you wish to record on a cassette whose tab has been removed, use adhesive tape to reseal the slot.
- ●To avoid excessive exposure to dust and fingerprints, do not open the front tape cover.



Storage of cassettes

- ●Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- ●Avoid storing the cassettes in humid or dusty places.
- ●Do not drop the cassettes. Do not expose them to violent vibrations or shocks.
- ●Do not expose the cassettes to strong magnetic fields (near a motor, transformer or magnet).
- ●Place the cassettes in cassette cases and position them vertically.

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FEATURES

- ●Allows direct playback with no additional components necessary.
- ●Flying erase head for precise, quality assemble/insert editing.
- ●Ultra-compact and ultra-lightweight a mere 1.2 kg.
- ●3-Page Digital Superimpose function for mixing titles or illustrations into a live recording.
- ●Multiple-speed electronic shutter for sharp clear playback of fast-action shots — 1/1000, 1/500, 1/250, 1/50 (standard)-second.
- ●Insert editing function.
- ●Audio dubbing facility.
- ●Newly developed high-resolution 1/2" field-storage type CCD (Charge Coupled Device) pickup.
- ●One-button full-auto operation of focus, exposure, and white balance.
- ●Powerful, two-speed 6:1 power zoom.
- ●HQ (High Quality) System for superlative picture quality.
- ●High-sensitivity/low-lag design: allows shooting in light as low as 10 lux.
- ●Image Sensing auto-focus.
- ●Automatic Colour Tracking white balance with three preset positions.
- ●Backlight compensation button.
- ●Audio/video fader linked to start/stop trigger.
- ●Animation function using the Remote Control Unit RM-V15U (optional).
- ●Large, easy-to-read LCD (Liquid Crystal Display).
- ●Ultra-compact adjustable electronic viewfinder (monochrome CRT, 0.6-inch screen) with diopter control, also for instant on-the-spot playback.
- ●Selectable automatic date recording function.
- ●Recordable date/time display.
- ●Elapsed recording time counter.
- ●Retake function for quick re-recording of scenes when necessary.
- ●Second recording start/stop button provided on top of GR-60E.
- ●Dubbing mode switch provided for best results when dubbing.
- ●Selectable quick review function.
- ●One-button recording standby mechanism.
- ●Master Edit Control system: allows control of both GR-60E and connected designated JVC VCR using GR-60E's controls, and preroll editing for edits free of transition-point gaps and noise.
- ●Shuttle Search in both directions.
- ●Unique grip battery doubles as palm grip, saving weight and space.
- ●Ergonomic design with palm grip and thumb rest for trigger control.
- ●Trigger alarm system for preventing recording errors.
- ●Three-way power supply flexibility: battery pack, AC power adapter, and car battery.

The GR-60E is designed to be used with PAL-type colour television signals. It cannot be used for playback with a television of a different standard. However, live recording and viewfinder playback are possible anywhere. Use the BN-V5GU/BN-V6GU/BN-V7GU battery packs and, to recharge them, the provided multivoltage AC power adapter/battery charger. (An appropriate conversion adapter may be necessary to accommodate different designs of AC outlets in different countries.)

CONTROLS AND CONNECTORS

Refer to the diagrams on the front foldout page.

❶ **External microphone jack (MIC)**

❷ **Exclusive microphone**
Omnidirectional condenser microphone for simultaneous sound recording.

❸ **6:1 zoom lens**
F/1.4, f = 9 – 54 mm. Filter diameter: 49 mm.

❹ **Auto-focus sensor window**
Allows light to enter for measuring the camera-to subject distance.

❺ **White balance sensor window**
Allows light to enter for white balance adjustment.

❻ **Electronic viewfinder**
For monitoring scenes being shot or the playback picture after recording. Several indicators are included, as well as the date/time or elapsed recording time if selected.

❼ **FULL AUTO button**
Pressing this button puts the focus and white balance under automatic control and selects the standard shutter speed. Auto-focus can be cancelled by pressing the FOCUS button; auto white balance can be cancelled by pressing the W.BALANCE button; the high-speed shutter can be selected by pressing the SHUTTER button. Pressing the FULL AUTO button in the full-auto mode has no effect.

❽ **FOCUS select button**
Switch to AUTO for automatic focus, and switch to MANUAL to focus manually. Check on the LCD. The focus mode is reversed each time this button is pressed. The auto-focus mode can also be selected (together with the auto-white mode) by pressing the FULL AUTO button.

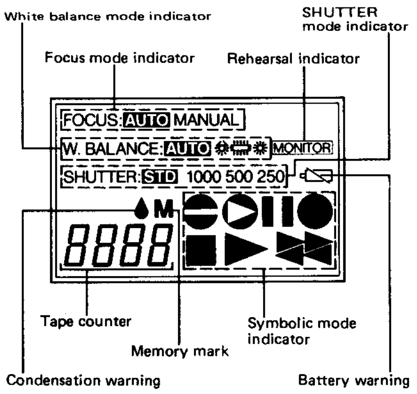
❾ **SHUTTER select button**
Pressing this button switches the shutter between 1/1000 ("1000"), 1/500 ("500"), 1/250 ("250")-second high-speed shutter and 1/50-second ("STD") speeds, as displayed on the LCD. The standard shutter speed can also be selected by pressing the FULL AUTO button.

● **W. BALANCE select button**
The white balance is manually selectable using this button. Press once to display the current white balance mode in the LCD. Continue pressing to cycle through the available modes.

✹ : Halogen or tungsten lighting.
▭ : Fluorescent lighting.
✹ : Daylight.
AUTO: Automatic white balance adjustment.

● **Counter MEMORY button**
Press this button after resetting the counter to "0" at a point on the tape you want to locate later, and the tape will stop automatically at the counter reading of around "0" during rewind or fast forward.

● **LCD (liquid crystal display)**



Tape counter:	Shows from "0" to "9999".
Battery warning:	Blinks when the battery power becomes insufficient for normal operation.
Condensation warning:	Appears when excessive condensation occurs inside the unit.
Memory mark:	Appears when the MEMORY button is pressed.

Symbolic mode indicator

STOP:	■	REWIND:	◀◀	RETAKE FORWARD:	▶▶▶ Blinking
PLAY:	▶	FAST FORWARD:	▶▶	MASTER EDIT CONTROL:	▶ Blinking
PAUSE: (STILL)	❚❚	REVERSE SHUTTLE SEARCH:	▶◀◀	TAPE END WARNING:	● Blinking
RECORD:	●	FORWARD SHUTTLE SEARCH:	▶▶▶	INSERT:	◐
RECORD PAUSE:	❚❚●	RETAKE REWIND:	▶◀◀ Blinking	AUDIO DUB:	⊖
QUICK REVIEW	❚❚● Blinking				

● **Counter RESET button**
Press to reset the counter to "0".

● **Cassette holder**
Insert a VHS-C video cassette for recording or playback.

● **POWER switch**
Slide to turn the power on. The Stop indication appears on the LCD. Slide again to switch off power.

● **REC standby button**
Press to engage the Recording standby mode. To start recording, press either of the recording start/stop buttons ●, ●.

● **INSERT/MONITOR button**
Push this button when you wish to rehearse shots before actually recording them. This function allows you to view the scene on the viewfinder without recording it. Push the STOP button to release it. To enter the Insert Edit mode, press this button while in the Recording Standby mode.

● **AUDIO DUB button**
Press this button together with the PLAY button for audio dubbing.

● **QUICK REVIEW/EDIT button**
If you want to review the end of the recorded segment for confirmation, press this button from the Record-Pause mode; the tape will be rewound for about two seconds of programme time and played back automatically for this section, after which it will stop in the Record-Pause mode in standby for the next shot. When dubbing from the GR-60E to a designated JVC VCR, it also functions to begin VideoMovie playback in synchronization with video deck recording (see "Master Edit Control system", page 24).

● **REW/SHUTTLE SEARCH button**
Pressing this button in the Stop mode rewinds the tape; pressing it in the Play mode allows fast playback in reverse.

● **PLAY button**
Press to start playback. When this button is pressed when the unit is in the REC PAUSE mode, the unit will enter the REC mode.

● **FF/SHUTTLE SEARCH button**
Pressing this button in the Stop mode fast-forwards the tape; pressing it in the Play mode allows fast playback.

● **PAUSE/STILL button**
Press to view a still picture during playback or pause playback. When this button is pressed in the REC mode, the unit will enter the REC PAUSE mode.

● **STOP button**
Press to engage the Stop mode.

● **EJECT switch**
To open the cassette holder.

● **DUBBING ON/OFF switch**
Normally, set to OFF. For best picture quality when dubbing, set it to the ON position.

● **REMOTE control jack**
For connection of the optional RM-V15U remote control unit.

● **Earphone jack (PHONE)**

● **AV OUT connector**
Both audio and video signals can be delivered from this connector. For playback with a TV set not equipped with A/V terminals, connect the RF-V3E RF unit (provided) to this connector and to the TV. To dub from this unit, connect the A/V input connectors of a second recorder to this connector, using the optional A/V output cable. To play back from this unit to a TV set, make a connection between this connector and the TV's A/V input terminals using the A/V output cable.

● **ALARM ON/OFF switch**
Switch to ON to engage the trigger alarm system. Switch to OFF when you do not wish to use this system.

● **Thumb rest**
Place your thumb on this grooved area next to the start/stop switch between switch operations.

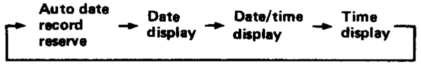
● **Recording start/stop button (Trigger button)**
Press this button in the Recording Standby mode to start recording. Pressing it again re-engages the Recording Standby mode.

● **Second recording start/stop (SUB TRIGGER) button**
Functions exactly as the other recording start/stop button, for use when recording with the GR-60E held low.

● **DATE/TIME ON/OFF button**
Press this button when you do not wish to record the date/time. This will remove date/time indications from the viewfinder. Press again to record date/time. Date/time will reappear in the viewfinder.

● **REC TIME RESET button**
Press this button to reset the elapsed recording time to zero. Ejecting the cassette also does this.

● **DATE/TIME MODE button**
Press this button to select the date/time display and Recording mode. It cycles through the modes in the following order:



The auto-date-record function automatically displays and records the date for 5 seconds upon turning on the power and beginning recording. Before recording begins, this mode is indicated in the viewfinder by auto date record reserve indication "-.-.-".

㊲ **Viewfinder mount**
Attach the provided viewfinder.

㊳ **TITLE PAGE button**
Press this button to select which page of memory you wish to store your title in. This button only functions when the title is displayed in the viewfinder.

㊴ **TITLE ON/OFF button**
Press to mix memorised title or illustration with action being recorded. Press again to end mixing process.

㊵ **Macro button**
Turn the zoom ring while pressing this button for macro shooting.

㊶ **Manual zoom lever**
Use to turn the zoom ring manually.

㊷ **Manual focus ring**
Use to turn the focus ring manually.

㊸ **Lens hood**

㊹ **REC TIME ON/OFF switch**
When this switch is set to ON, the viewfinder displays the elapsed recording time. Switch to OFF to cancel the display.

㊺ **DATE/TIME SELECT button**
Use to select the portion of the clock or date settings to be changed. Cycles through the year, month, day, hour, and minute settings. To end adjustment, press once after selecting the minute portion.

㊻ **DATE/TIME SET button**
Use to set the built-in clock and date function.

㊼ **Viewfinder cable connector (EVF)**
Connect the viewfinder cable.

㊽ **Power zoom buttons**
For automatic zooming at slow speed, press lightly. For regular speed zooming, press firmly. "T" is for telephoto zooming and "W" is for wide-angle zooming.

㊾ **IMAGE REVERSE button**
Press this button to activate the title reverse effect. The function will switch from positive to negative mode with successive pressing of this button.

㊿ **TITLE MEMORY button**
Up to three "pages" of titles can be stored. The digital memory is maintained by the lithium battery which powers the unit's clock. Each time the TITLE MEMORY button is pressed, a previously stored title will be erased, and a new one will be stored in its place in the designated page of memory.

(51) **COLOR button**
Press this button to select the colour for a title or illustration. The colour choices cycle as follows: black, white, yellow, cyan blue, green, magenta, red, blue. Press this button repeatedly until the desired colour appears.

(52) **Lens cap**
Cap the lens when not in use.

(53) **Dioptric adjustment control**
Adjusts the viewfinder lens to suit the operator's eyesight.

(54) **Slots for shoulder strap**

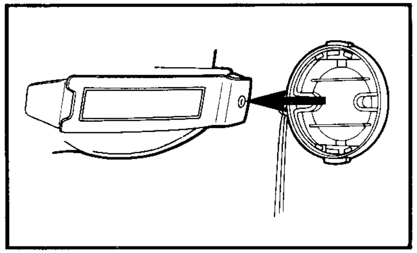
(55) **TRACKING control**
Minimises noise bars, if observed, during playback.

(56) **DC IN terminal**
For connection of the provided AA-V5EG AC power adapter/battery charger, optional BH-V5E car battery charger or AP-P1E car battery cord for DC power supply.

(57) **Grip strap**
Secures the operator's hand to the hand grip. Adjusts to fit hand size.

(58) **Battery mount**
The battery pack serves as a contoured handgrip when attached to the battery mount.

(59) **Lens cap hook**
This keeps the lens cap from swinging during shooting.



(60) **Battery pack release lever**

(61) **Tripod mounting socket**

(62) **Stud hole**

(63) **CLOCK battery compartment**
Holds the lithium battery that powers the date, time and title memory function.

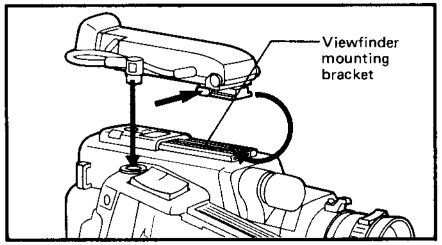
(64) **BLC button**
Iris control is always automatic. For backlight compensation, press this button. While it is being pressed, the iris is 1 – 2 f-stops wider than the automatic setting.

(65) **FADER button**
To fade out the picture to a black blank screen, press this button, then press the recording start/stop button to start fading out. To fade in from a black blank screen, press this button, then press the recording start/stop button to start fading in.

BASIC PREPARATIONS

Switch off power before mounting or removing viewfinder.

Mounting the viewfinder

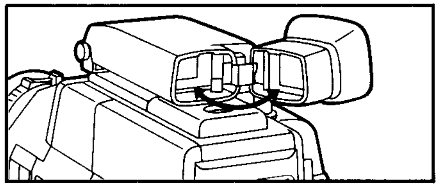


1 Align the viewfinder's coupling fixture with the mounting bracket on the body and slide the fixture into the bracket while pressing the knob.

2 Connect the viewfinder cable to the viewfinder cable connector (EVF).

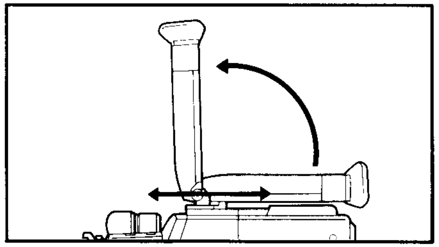
To remove the viewfinder:
Pull out the viewfinder cable and slide the viewfinder out of the bracket while pressing the knob.

Opening the eyepiece



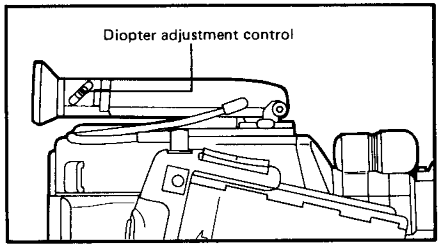
The veiwfinder eyepiece can be opened for cleaning or better viewability in playback.

Positioning the viewfinder



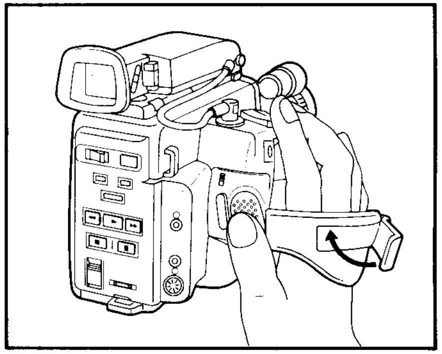
The viewfinder can be positioned for best viewability. It can slide forward or back and can be tilted up 90°.

Diopter adjustment



The viewfinder lens can be adjusted to suit the operator's eyesight by sliding the diopter adjustment control.

Adjusting the grip strap



1 Separate the Velcro strip to expand the loop.

2 Pass your right hand through the loop and grasp the lens grip. Adjust the length of the strap to suit your hand size and refasten the Velcro strip.

POWER SUPPLY SYSTEM

The convenient 3-way power supply system gives you a choice of the most appropriate power supply unit, depending on the application.

CAUTION
- No function is available without power supply.
- Do not use any power supply other than specified.
- Never attempt to use these power supply units with any equipment other than the VideoMovie.

When AC power is not available

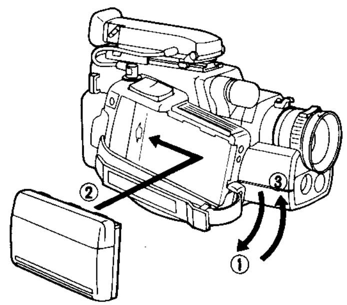
Use the battery packs:
- BN-V5GU (Regular)
- BN-V6GU (High-capacity)
- BN-V7GU (Super High-capacity)

Note:
The battery pack has been kept in the uncharged state for shipment. Therefore, before use, be sure to charge it. See page 27.

Attaching the Battery Pack

① Pull down the battery pack release lever.
② Align the battery pack over the outline in the battery pack mount, and slide the battery pack into place in the direction of the arrow.
③ Push up on the battery pack release lever, until it locks into place.

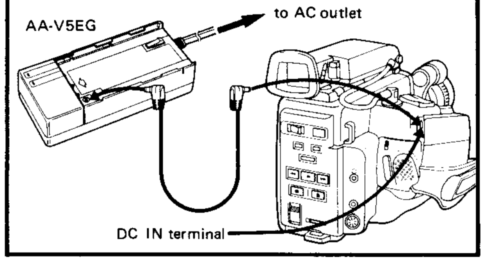
To remove the battery pack, pull down the battery pack release lever and slide out the battery.



With AC power

Use the provided AA-V5EG AC power adapter/battery charger.

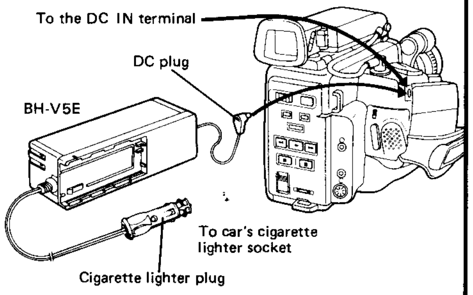
Note:
This unit can be used with 110 V to 240 V power supplies. Selection is automatic and no adjustment is required.

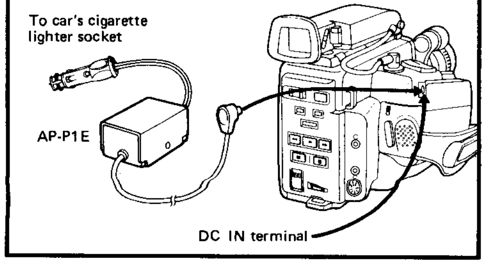


In a car

Use the optional AP-P1E car battery cord or BH-V5E car battery charger.

- Leave the car's engine idling when using the car battery. (For use with 12 V negative-grounded cars only.)

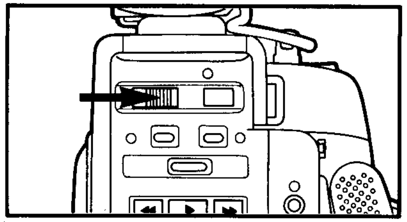




LOADING AND UNLOADING A VIDEO CASSETTE

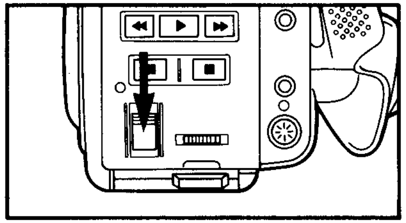
LOADING

1



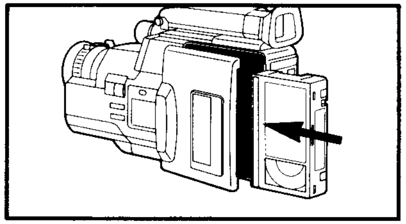
Slide the POWER switch to turn power on.

2



Open the cassette holder by pressing the EJECT button.

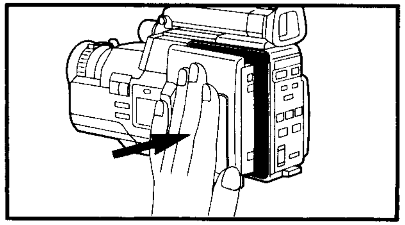
3



Insert the cassette with its printed arrow facing outward.

Ensure that tape is not slack inside the cassette, then load the cassette correctly. See page 3.

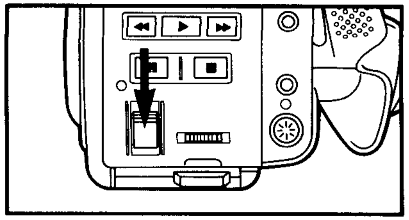
4



Close the cassette holder by pushing its centre area.

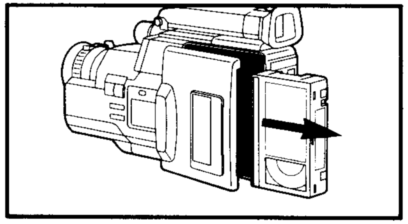
UNLOADING

1



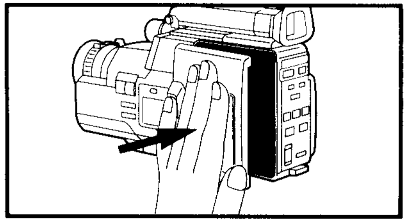
Make sure the unit is in the Stop mode. Press the EJECT button. The cassette holder will open.

2



Remove the cassette.

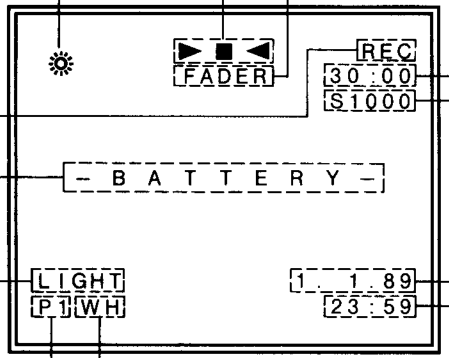
3



Close the cassette holder by pushing its centre area.
- When not in use, switch off power.

Note:
- Do not repeat loading and unloading of the cassette without running the tape, as this will slacken the tape, causing tape damage.

VIEWFINDER INDICATIONS



Focus mode

▶	Camera is focused beyond subject
■	Focus is correct
◀	Camera is focused in front of subject
—▶■◀—	Low contrast warning (auto/manual)
No indication	Auto-focus is operating

White balance mode setting

☼	Daylight.
▦	Fluorescent lighting.
✲	Halogen or tungsten lighting.
No indication	Auto white balance is operating.

Fading mode

FADER	Fade function is engaged.
—FADER—	Fading is being performed.
No indication	Fade function is not engaged.

Elapsed Time Indicator

Lithium battery warning

▶E	Lithium battery is exhausted, or not yet installed.

S1000
1/1000-second shutter mode is engaged
S500
1/500-second shutter mode is engaged
S250
1/250-second shutter mode is engaged
No indication
1/50-second (standard) shutter mode is engaged

Date indications

Time indications
24 hour indications

–.–.–. .	Auto Date Rec is engaged .

Title Page indicator

P1	First page
P2	Second page
P3	Third page

Title Colour indications

BK	Black
WH	White
YL	Yellow
CY	Cyan blue
GR	Green
MG	Magenta
RD	Red
BL	Blue

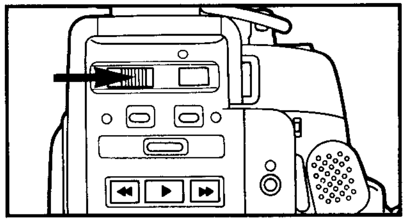
—LIGHT—	Low-light warning
—BATTERY—	Low-battery warning

Operation mode

REC	Recording is being performed
—	Recording Standby mode is engaged
—REC—	Tape-end warning (blinking will begin a few minutes before tape ends)
No indication	Stop, Play or Rehearsal mode is engaged

RECORDING OPERATIONS

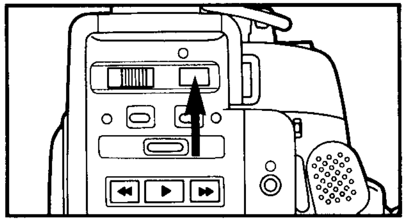
1



Slide the POWER switch to ON.

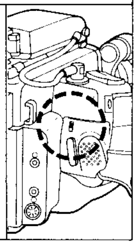
2 Insert a video cassette correctly (with its safety tab in place).

3



Press the REC Standby button. The unit enters the Recording Standby mode.

Trigger alarm system



When the ALARM ON/OFF switch is set to ON, an electronic alarm beeps when the Recording start/stop button is pressed to begin recording.
The electronic alarm beeps twice when the Recording start/stop button is pressed for record pause. This alarm helps prevent recording errors.

Elapsed time display

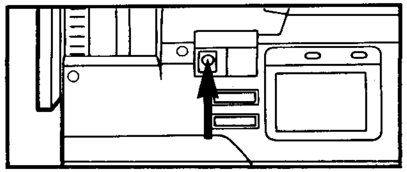
The accumulated recording time (elapsed time) can be displayed on the viewfinder.

1. Set the REC TIME ON/OFF switch to ON. The recording time is displayed on the viewfinder screen.
2. If you wish to reset it to "00:00", press the REC TIME RESET button.

Notes:

- When you wish to disengage the Elapsed Time Display mode, set the REC TIME ON/OFF switch to OFF.
- Unloading the cassette also resets the display to "00:00".

4



For full-auto operation, press the FULL AUTO button.

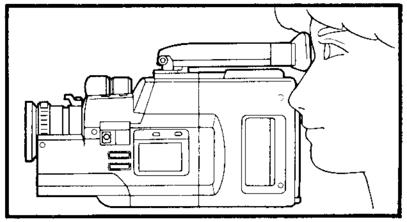
For manual override, use the W. BALANCE and FOCUS buttons.

- Press the W. BALANCE button so that the required symbol appears on the viewfinder and on the LCD.
  - ✲ : when the subject is illuminated by a halogen or tungsten lamp.
  - ▦ : when the subject is illuminated by a fluorescent lamp.
  - ☼ : when you shoot in the daytime outdoors.
- When shooting under fluorescent light, always use the fluorescent light setting in the manual white balance mode for best results.
- For manual focus, press the FOCUS button so that MANUAL is shown on the LCD. A focus-aid indicator will appear in the viewfinder. (See page 14.)
- Iris control is always automatic. Therefore, possible combinations of auto and manual functions are as follows:

Control / Function	FULL AUTO	W. BALANCE	FOCUS	FOCUS W. BALANCE
White balance	Auto	Manual	Auto	Manual
Focus	Auto	Auto	Manual	Manual
Iris	Auto	Auto	Auto	Auto

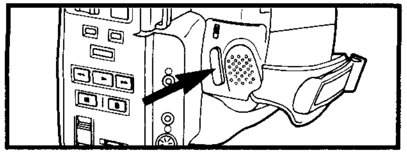
- Be careful not to cover the white balance sensor window, otherwise correct white balance will not be obtained in the auto focus mode.
- For high-speed electronic shutter, see page 15.

5



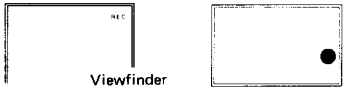
Determine the focus and composition by referring to the viewfinder image. For zooming, see page 18.
For date/time recording, see page 17.

6



Press the start/stop button.

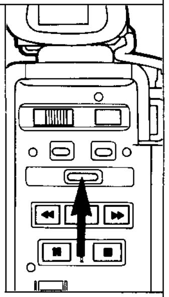
- This causes the recording indicator to appear on the viewfinder screen and the LCD, showing that recording is actually taking place.



7

To stop recording temporarily, press the start/stop button once again.

Quick Review function



- If you want to review the end of the last recording for confirmation, press the QUICK REVIEW/EDIT button from the Recording Standby mode; the tape will be rewound for about 2 seconds of programme time and played back automatically for this section, after which it will stop in the Recording Standby mode for the next shot.

Notes:

- The TRACKING control should be at its centre position.
- Distortion might occur when playback starts. This is normal.

8

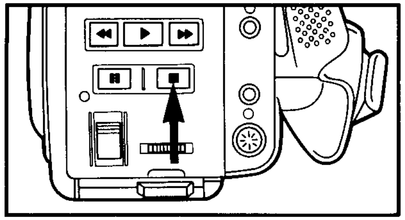
To restart recording, press the start/stop button.

- For a pause longer than 3 minutes, press the POWER switch to OFF.
- If the Recording Standby mode continues for longer than about 5 minutes, the unit switches itself off automatically. To restart recording, turn the power on. This makes clean assembled recordings possible even after a long pause.

Assemble recordings

- Repeating steps 6 and 7 produces assemble recordings.
- If recording is restarted from the Stop mode, a few frames of the previously recorded picture *are replaced with a new recording.* To avoid this, follow the technique described in "Assemble Recording Technique-2" on page 16.

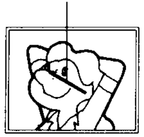
9



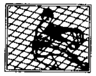
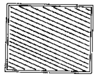
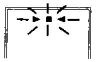
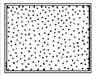
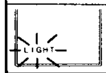
To end recording, press the STOP button.

- After making sure that the tape has stopped, press the POWER switch to OFF.

Precautions for auto-focus



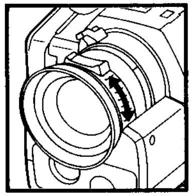
- A small area around the centre of the picture, which varies depending on the zoom and focus conditions, is used to detect focus. (no actual indication provided on the screen.)
- Do not touch the focus ring while the auto-focus mechanism is in operation.
- Be careful not to cover the auto-focus sensor window, otherwise accurate focusing will not be possible.
- When not in use, do not leave the GR-60E in the Auto-focus mode with power on; otherwise light entering the auto-focus sensor window will operate the auto-focus mechanism, consuming power.
- If the lens and/or auto-focus sensor window are smeared with stains or blurred with condensation, accurate focusing is not possible. Keep them clean. If they become dirty, wipe with a piece of soft cloth. When condensation occurs, dry them by wiping with a soft cloth or wait for conditions in which they become dry.
- Correct focus may not be obtained in the following situations. In such cases manual focusing should be performed to obtain proper focus.

	Two subjects at different distances overlap in the same scene.		Slanted lines only.
	Low contrast.		Minute patterns or identical patterns that are regularly repeated.
	Low illumination.		

Caution:
Be careful not to touch any buttons inadvertently during shooting.

Manual focus

If the manual focus mode is selected, proceed as follows:

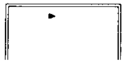
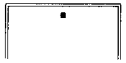
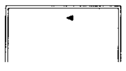
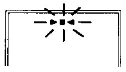


1. Zoom in on a subject by pressing the "T" button.
2. Focus onto it by turning the focus ring. Refer to the focus aid indication chart below.
3. Determine the composition by pressing the "W" button.

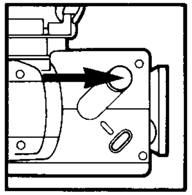
Notes:

- When you use the Manual Focus mode, be sure to focus the lens in the maximum telephoto position. If you focus in on a certain subject in the wide-angle position, sharply-focused images cannot be obtained when zoomed up because the depth of field is reduced at longer focal lengths.
- Covering the white balance sensor while manually focusing will result in poor colour reproduction.

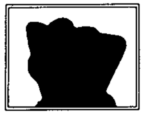
Focus indicators

Condition	Indication	Corrective operation
Focus point behind the subject		Turn the focus ring clockwise until the centre square lights.
Correct focus		Keep the focus ring in the same position.
Focus point in front of the subject		Turn the focus ring counterclockwise until the centre square lights.
Indication not possible because of low contrast		Estimate the subject distance and set the focus ring referring to the distance scale on it.

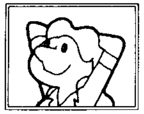
Backlight compensation



- Press the BLC button. While it is being pressed, the iris is 1 – 2 f-stops wider than that adjusted automatically.
- When excessive lighting is located in back of the subject, correct exposure may not be obtainable. To compensate for this, use BLC.

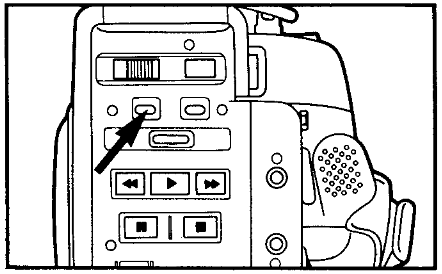


Without BLC



With BLC

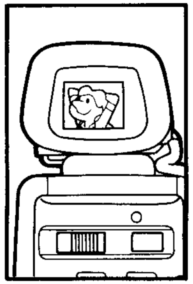
Rehearsal



If you wish to rehearse shooting angles, compose scenes, etc., without actually recording on the tape, press the INSERT/MONITOR button, instead of REC. The aimed-at scene will appear on the viewfinder screen. For full-auto rehearsal, also press the FULL AUTO button. To engage the Recording Standby mode from rehearsal, press the REC button. To disengage the Rehearsal mode, press the STOP button:

- Rehearsal is possible whether a cassette is loaded or not.
- With a cassette loaded, rehearsal is not possible during rewind or fast forward.
- The power save circuit does not function during rehearsal. (For power save function, see page 16.)

Viewfinder Monitoring



- Rewind the tape to a point from which you want to check the recording.
- Press the PLAY button, and you can view the playback picture on the viewfinder screen.
- Pressing the PAUSE/STILL button during playback stops the picture on the viewfinder screen.
- Shuttle search is also possible in both directions.

RECORDING THE DATE/TIME

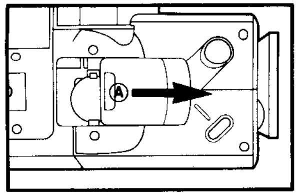
Warning on lithium battery
- **Dispose of used battery promptly.**
- **Keep away from children.**
- **Do not disassemble and do not dispose of in fire.**

Battery insertion

- Switch off the unit's power before inserting the battery.

This battery powers the date/time function.

1. Slide the cover off the CLOCK battery compartment on the bottom of the VideoMovie by pressing lightly on the section labelled Ⓐ in the diagram.
2. Insert the provided lithium battery **with the plus (+) side up.**
3. Slide the cover on the unit until it clicks.

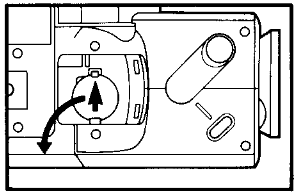


Battery replacement

- Switch off the unit's power before removing old battery.

The battery lasts for about one year. When the lithium battery warning (▶E) appears in the viewfinder, this battery needs to be replaced. Obtain a new CR 2025 lithium battery and perform the following procedure.

1. Remove the battery by pressing the knob in the direction of the arrow.
2. Insert the new CR 2025 **with the plus (+) side up.**
3. Slide the cover back until it clicks.



Note:

- Replace battery with Panasonic (Matsushita type) CR 2025 only. Use of another battery may present risk of fire and explosion.

Date/time setting

Before adjusting the date and time for the first time or after replacing the batteries, 1.1.89 blinks in the viewfinder, indicating the clock needs to be set.

① Switch the unit's power on, 1.1.89 will blink in the viewfinder. Press INSERT/MONITOR button to enter rehearsal mode.

② Press the DATE/TIME SELECT button – the year blinks.

③ Press the DATE/TIME SET button to choose the correct number.

④ Press the DATE/TIME SELECT button to select the next item to change, with the item selected changing in the following sequence:

Year → Month → Day → Hour → Minute → Finish Adjustment

⑤ Repeat steps ② and ③ to set all items. After the minute setting has been performed, press the DATE/TIME SELECT button, and items will cease blinking, and the clock will resume normal function. For the auto date record mode, the auto date record reserve indicator will appear.

Date/time recording

The date, time, or date and time can be displayed and recorded according to the selected mode. Press the DATE/TIME MODE button to cycle through the modes in the following order:

→ **Auto date record reserve → Date display → Date/time display → Time display**

Date/time recording indications

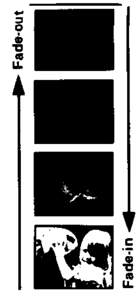
- When the auto-date-record function is selected, "-.-.-" appears in the viewfinder until recording begins. As long as this function is chosen, the date will be automatically displayed and recorded for about 5 seconds following the first operation of the recording start/stop button after the power is turned on.
- Auto date record reserve indication will cease to be displayed, if the DATE/TIME ON/OFF button is set to OFF unless power is reapplied.

Auto date record		**Date display**	**Date/time display**	**Time display**
—.—.—	31 . 12 . 89	31 . 12 . 89	31 . 12 . 89 14 : 30	14 : 30
Auto date record reserve	Auto date record executed			

SPECIAL TECHNIQUES

Fade-in/out

The GR-60E is equipped with an automatic fade mechanism for allowing smooth fade-in and fade-out with a black-coloured blank screen. Audio also fades in sync with video.



Automatic fade-in

1 Determine the composition in the Recording Standby mode and press the FADER button to reserve the fade-in mode.

2 Press the start/stop button. The screen will quickly become black and recording begins. When the start/stop button is released, fade-in will start. It will be completed in about 5 seconds. If the start/stop button is not released when pressed, the black picture will remain on the screen and be recorded.

Automatic fade-out

1 Start shooting as usual.

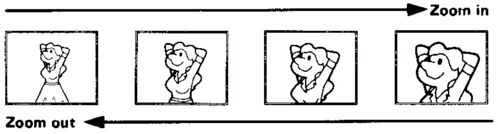
2 Press the FADER button to reserve the fade-out mode.

3 Press the start/stop button. Fade-out will start and be completed in about 5 seconds. When completed, Recording Standby mode is entered. If the start/stop button is not released when pressed, the final black picture remains on the screen and continues to be recorded, until the button is released.

- FADER is displayed in the viewfinder when fading is reserved, and continues to be displayed until fading in or out is completed.

Zooming

When the focal length of the lens is varied by turning the zoom ring, the image appears to come nearer to or retreat from the viewer.



Power zooming

Press "T" for zooming in and "W" for zooming out. Two zooming speeds are available. For slow-speed zooming, press lightly. For regular-speed zooming, press firmly.

Manaul zooming

Rotate the zoom lever downwards for zooming in and upwards for zooming out.

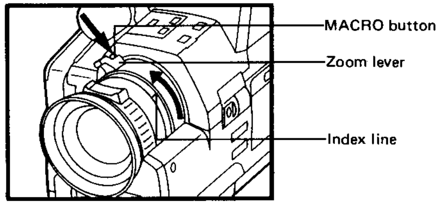
Macro shot

Normally, focusing is possible only for subjects that are more than 1.1 m away from the camera. By setting the lens to the Macro-mode, it is possible to manually focus in on any subject located inside that limit, right up to the front of the lens. The MACRO and ZOOM ranges combined give continuous shooting ability from close-up to infinity.

1 First engage the Manual Focus mode. While pressing in the macro button, turn the zoom lever in the direction of the arrow until the number "9" on the zoom ring passes the index line.

2 Focus by turning the zoom lever slowly.

3 To release the Macro mode, turn the zoom lever back, in the opposite direction from step 1 above, until the number "9" passes the index line.



- Use the zoom lever to focus in the MACRO range.
- Turning the zoom ring will slightly alter the angle of view of the lens.
- It is advisable to increase illumination when shooting in macro for best results.
- The auto-focus mechanism does not function during macro shooting.

Multiple-speed electronic shutter

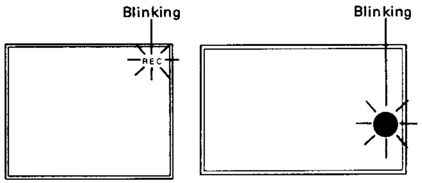
The GR-60E is equipped with a selectable high-speed shutter that allows better recording of quick movements for sharp, clear stills or slow-motion playback. Select it when taping fast-action shots that you will want to play back later in the Still or Slow-motion mode.

1. Select the shutter speed among 1/1000, 1/500, 1/250 and Standard (1/50)-second by pressing SHUTTER button. This can be done while recording or in any other mode. It continues at the selected speed until switched to another speed. When selected, the High-Speed Shutter mode is indicated on the viewfinder screen and LCD.
2. When finished recording the fast-action scene, switch back to the standard shutter speed by pressing the SHUTTER button until STD appears on the LCD.

Notes:
- The High-Speed Shutter mode requires slightly more subject illumination than the Standard Shutter mode. Therefore, the low-light warning may blink in the viewfinder. If so, switch to the Standard Shutter mode.
- Picture colour may be adversely affected in the High-Speed Shutter mode when the subject is lit by alternating discharge-type light sources such as fluorescent or mercury-vapour lights.
- When playing back a section recorded in the High-Speed Shutter mode, movement of subjects in the picture may not be smooth. This is not due to any defect of the unit.
- Pressing the FULL AUTO button also restores the shutter speed to the standard level.

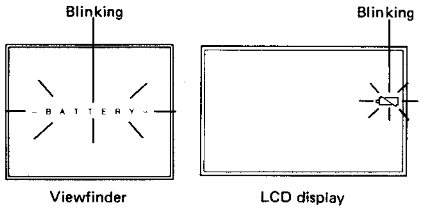
Warnings

Tape-end warning



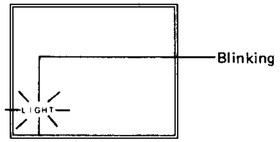
- The recording indicator blinks on the viewfinder screen and the LCD a few minutes before the end of the tape.
- When the end of the tape is reached during recording, the Stop mode engages automatically.

Battery warning



- When the battery power is coming to an end, a battery warning indication appears in both the viewfinder and the LCD. Replace the battery pack with a fully charged one.
- After these indications appear, the power turns off automatically. In this state, however, pressing the POWER switch while holding EJECT button pressed turns the power on and ejects the cassette.

Low-light warning



- If the blinking "LIGHT" indicator appears on the viewfinder screen, the amount of light is insufficient. Increase the lighting.

POWER SAVE AND TAPE PROTECTION CIRCUIT

- To save bettery power, the GR-60E (when battery-operated) switches itself off automatically in the following situations:
  (1) When left for longer than 5 minutes in the Stop mode.
  (2) When left for longer than 5 minutes in the Recording Standby (Record-Pause) mode.
- To protect the tape, the GR-60E (regardless of whether battery-operated or AC-powered) releases tape tension slightly and switches itself off automatically if left for longer than 5 minutes in the Recording Standby (Record-Pause) mode.
- For the same reason, the GR-60E enters the Stop mode and switches itself off automatically if left for longer than 5 minutes in the Still (Play-Pause) mode.

Battery operation

STOP → POWER OFF
5 minutes

Battery/AC operation

RECORD PAUSE → POWER OFF
5 minutes

PLAY PAUSE (STILL) → STOP → POWER OFF
5 minutes

ASSEMBLE RECORDING TECHNIQUE — 1 (To replace the battery pack during recording)

1 If the battery warning appears in the viewfinder or the LCD while recording, stop recording by setting the POWER switch to OFF, not the STOP button.

2 Replace the battery pack with a charged one.

3 Set the POWER switch to ON.
- The unit will be in the Recording Standby mode.

4 Press the recording start/stop button to start recording.

ASSEMBLE RECORDING TECHNIQUE — 2 (To search for the assemble point with the "Retake" function)

1 Make sure the camera is in the Recording Standby mode. (If not, engage the mode.)

2 Press either REW/FF button to reach the point where you wish a new recording to start. When the REW/FF button is released, the camera will enter the Recording Standby mode again.

3 Press the start/stop button to start recording.

ASSEMBLE RECORDING TECHNIQUE — 3 (To record onto a partially recorded tape)

1 Play back the tape to a point where you wish a new recording to start.
- Use the SHUTTLE SEARCH button for faster location.

2 Press the PAUSE/STILL button at the located point.
- The unit will enter the Still mode.

3 Press the REC button.
- The unit will enter the Recording Standby mode.

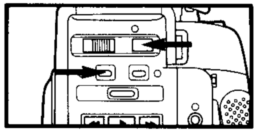
4 Press the recording start/stop button to start recording.

DIGITAL SUPERIMPOSE

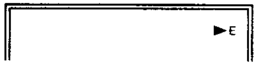
The GR-60E's Digital Superimpose function allows 3 titles to be superimposed on a recording in a choice of 8 colours and either positive or negative (reversed) styles for more creative video opportunity.

Storing Titles

1

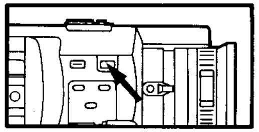


Put the unit into the REC PAUSE or REHEARSAL mode.



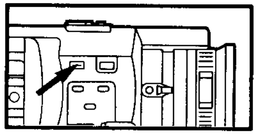
- When the "E" indication (lithium battery warning) appears in the viewfinder, titles cannot be stored. Insert the lithium battery, or replace the inserted one with a new one according to the instructions on page 17.

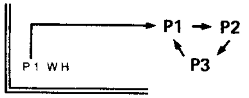
2



Press the TITLE ON/OFF button.

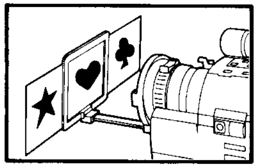
3

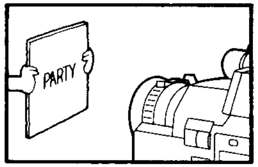




Use the TITLE PAGE button to select the page of memory in which you want your title to be stored. The page number will appear on the viewfinder screen.

4

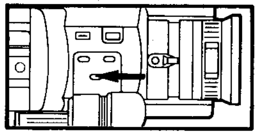




Aim the unit at your title in as well-lit a location as possible. You may also use the provided Title Easel for this purpose.

- If, at this point, the vertical stripes or an old title appearing in the viewfinder prove bothersome, press the TITLE ON/OFF button to turn it off.
- When storing a title, the scene visible in the viewfinder may differ slightly from that which will be recorded on the tape.

5



Press the TITLE MEMORY button for about 1 second to store the title.

- When a title is stored poorly, check to see that the lighting is adequate and that the title is drawn with bold strokes, then shoot the title again.
- Every time the TITLE MEMORY button is pressed, the previously recorded title stored in that page of memory will be erased, and replaced with the new title.

Creating Titles

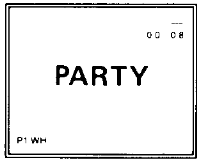
Make note of the following guidelines to assure best results.

1. Create titles using dark colours on light backgrounds – black writing on white paper, for example.
2. Letters should be drawn with broad strokes.

6 Press the COLOR button to select the colour in which you want your title to appear.

The colours will cycle in the following order:

BK → WH → YL
(Black) (White) (Yellow)
↑ ↓
BL CY
(Blue) (Cyan blue)
↑ ↓
RD ← MG ← GR
(Red) (Magenta) (Green)



7 Press the IMAGE REVERSE button to choose negative or positive style.

To store additional titles, in digital memory pages 2-3, repeat steps 3-7 above.

- The TITLE MEMORY button works in both the Rec Pause and Rehearsal modes; care should be exercised not to press TITLE MEMORY accidently as this will erase stored titles.

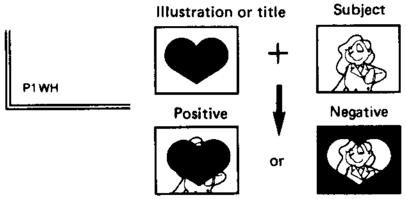
- The page selection can be changed when the TITLE ON/OFF button is ON.
- When a page of memory contains nothing, it is "empty", and a pattern of vertical stripes will appear in the viewfinder.
- When the power is turned off or the unit is put into the Stop mode, the PAGE mode returns to the page 1 position.

Making a title at the beginning of a recording

1 Put the unit into the REC PAUSE mode.

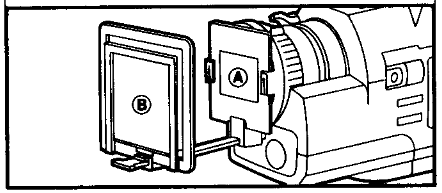
2 Press the TITLE ON/OFF button to display your title on the viewfinder screen.

3 Press the TITLE PAGE button until the title you wish to use is displayed. The pages will cycle from 1 to 3. Confirm the page, the colour, and the neg/pos style. Colour choice and neg/pos style can be changed at this point. Press the COLOR button to select a different colour, and the IMAGE REVERSE button to choose neg/pos style.



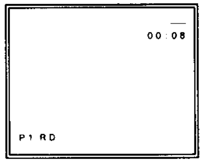
4 Press the unit's trigger to begin recording. The title will now be mixed with what you are recording.
Press the TITLE ON/OFF button when you wish to end the titled portion of your recording.

A photographic slide can be recorded by inserting it in Ⓐ and inserting a blank white card in Ⓑ of the provided title easel. Slides up to 1/8" thick can be used. Illuminate Ⓑ from behind for best results.



Inserting a title in the middle of a recording

1 Confirm the page, colour, and neg/pos style of your title.
Press the TITLE ON/OFF button to turn it off.



2 Shoot your live scene by pressing the VideoMovie's start/stop trigger.
Press the TITLE ON/OFF button when you wish to insert your title. It will be inserted into your ongoing recording at exactly that point.

3 Press the TITLE ON/OFF button again to stop inserting your title with the action you are recording.

Notes:

- Colour choice, page number, and IMAGE REVERSE selections can be changed when the title is displayed in the viewfinder.
- The "Colour" and "Page number" indications displayed in the viewfinder will not be recorded on the tape.
- When an "empty" page is called from memory, a pattern of vertical stripes will appear in the viewfinder.
- When the lithium battery for the unit's clock is exhausted, stored titles may be lost. For best results, replace the lithium battery before its one year required replacement date. When the lithium battery warning appears in the viewfinder, as long as power is still supplied to the unit by the main battery pack, or from an AC source (even if the unit's power switch is off), the digital memory will be retained, however, the lithium battery should be replaced at this time.

PLAYBACK

The GR-60E permits playback of recorded "VHS-C" video cassettes.
For connections refer to pages 22 and 23.

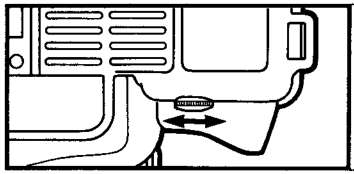
Preparations
- With a television equipped with audio/video input connectors, set the television's TV/VIDEO switch to VIDEO.
- With a regular television receiver, set the aerial select switch of the RF-V3E RF unit to VIDEO and the TV receiver's channel selector to your video channel (specified AV channel).

1 Connect a power supply unit. (Battery or AC operation: see page 9.)

2 Press the POWER switch to ON.

3 Insert a pre-recorded cassette and press the PLAY button. Playback will start.

Ensure that tape is not slack inside the cassette, then load the cassette correctly. See page 3.



Tracking adjustment
If noise bars appear on the screen, adjust the TRACKING control. Turn it slowly in either direction to minimise noise bars. After playing a particular tape, return the TRACKING control to the centre position.

Shuttle Search

Fast-speed playback in the forward direction

Press the FF button in the Play mode. Playback will be speeded up to 3 times normal speed.

Fast-speed reverse playback

Press the REW button in the play mode. The tape will be played back in the reverse direction at 3 times normal speed.

Still playback

Press the PAUSE/STILL button during playback. The picture will stop on the screen.
- After about 5 minutes of still playback, the unit enters the Stop mode automatically, for tape protection, and switches itself off.

Notes:
- For brief scanning, keep the Shuttle Search button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled.
- Noise bars will appear and pictures may become monochrome while in these modes. This is not due to any defect of the unit.

Counter Memory Function

The GR-60E incorporates a counter memory mechanism which facilitates locating a specific tape segment.

1 Press the RESET button to reset the counter to "0".

2 Press the MEMORY button. The "M" mark will appear.

3 After recording or playback, press the STOP button, then the REW button. The tape will automatically stop at the counter reading of around "0".

4 Press the PLAY button to start playback.

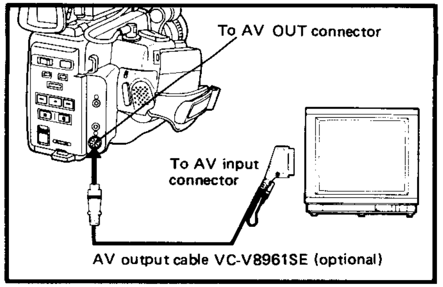
Notes:
- The counter memory function is effective in the Fast Forward mode as well.
- To cancel the memory function, press the MEMORY button.
- When the power supply unit is disconnected, all indications on the LCD disappear and the counter memory function is instantly cancelled.

CONNECTION TO A TELEVISION FOR PLAYBACK

① Connection to a television equipped with A/V input connectors

For this situation, use the optional AV output cable VC-V8961SE.

- Use the A/V output cable to simply connect the AV OUT connector of the GR-60E to the AV input connector (21-pin, SCART) of the TV.



② Connection to a television not equipped with A/V input connectors

For this situation, use the provided RF-V3E RF unit.

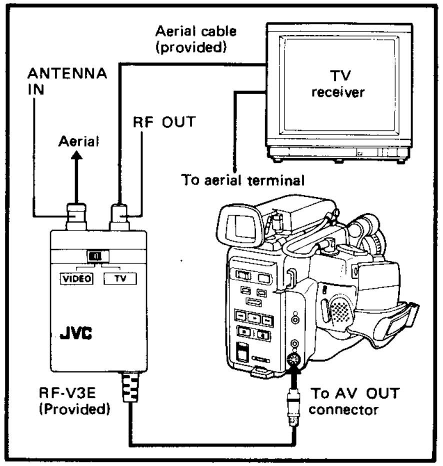
1 Remove the aerial cable from the TV receiver.

2 Connect the aerial cable to the ANTENNA IN terminal of the RF unit.

3 Connect the RF OUT terminal of the RF unit to the aerial terminal of the TV receiver using the provided aerial cable.

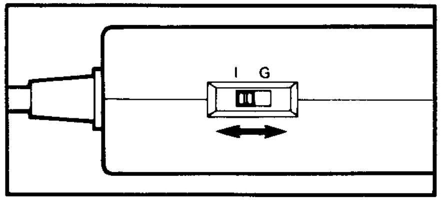
4 Connect the VIDEO/AUDIO INPUT cable of the RF unit to the AV OUT connector of the GR-60E.

5 Adjust the RF converter output channel according to your VIDEO CHANNEL. (See next page.)



PRECAUTIONS FOR RF-V3E (Provided)
- For exclusive use with the VideoMovie.
- Do not disassemble or remodel the RF-V3E.
- Do not expose it to strong shocks.
- Unplug the connected equipment during lightning storms. (Never touch the aerial cable.)

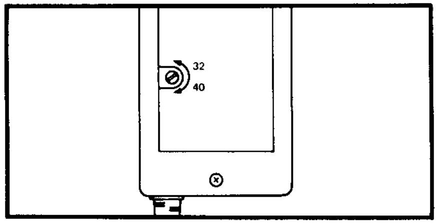
- **TV system select switch (I/G)**
  When you use a TV receiver built on the British PAL standard, shift the system select switch to "I".



- **Viewing video cassettes being played back with the GR-60E**
  To view video cassettes or to monitor the recording, set the VIDEO/TV switch of the RF unit to VIDEO and the TV channel selector to the channel corresponding to the RF output channel.
- **Viewing television programmes**
  Set the VIDEO/TV switch to TV, and the TV receiver will function as usual.

●RF converter channel adjustment screw

The RF unit permits playback of video and audio recordings through a TV receiver. The signals from the RF unit are viewed through a vacant channel not used for broadcasting in your area. The output frequency of the RF converter has been set to correspond to a broadcast on UHF channel 36. To view playback pictures from the GR-60E with your TV receiver, tune its specified AV channel to UHF channel 36. If channel 36 is employed for broadcasting in your area, readjust the RF converter output channel to one of the vacant channels between 32 and 40. To make this adjustment, remove the small cap on the back of the RF unit and turn the adjustment screw with a screwdriver to tune in a vacant channel.



●RF converter channel adjusting procedure

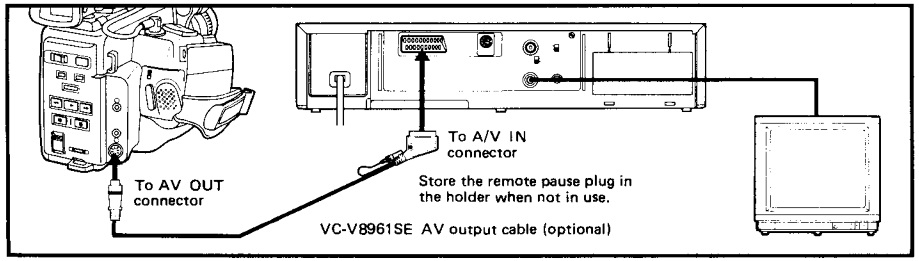
1. Set the AV channel of the TV receiver to one of the vacant channels.
2. Power the GR-60E.
3. Put the GR-60E in the Rehearsal mode (see page 14).
4. Set the VIDEO/TV switch of the RF unit to VIDEO.
5. While monitoring the output signal on the TV screen, turn the RF converter channel adjustment screw so that the monitored picture comes in most clearly.

CAUTION:
To view the GR-60E recordings with a TV receiver, use a TV receiver having a specified AV channel and employ this AV channel as your VIDEO CHANNEL, otherwise playback may be disturbed with vibrating or bending pictures. AV channels refer to channels exclusively for video playback; because AFC circuits are applied to these channels, the playback pictures can be stabilised. Recent TV receivers have one or more AV channels.

TAPE DUBBING OR EDITING

Connection

1. Set the DUBBING ON/OFF switch to ON.
2. Connect the AV OUT connector of the GR-60E to the A/V IN connector of the video recorder using the optional AV output cable VC-V8961SE.
3. Connect a television to the video recorder to monitor the picture while dubbing.


To AV OUT connector
To A/V IN connector
Store the remote pause plug in the holder when not in use.
VC-V8961SE AV output cable (optional)

Operation

●Put the GR-60E in the Play mode and the connected recorder in the Record mode to copy the recording. To edit out unwanted material, press the recorder's PAUSE/STILL button.

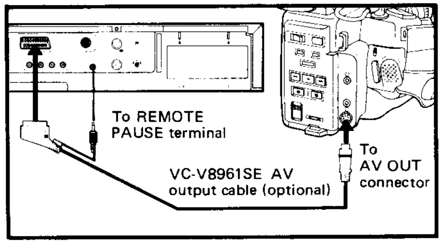
MASTER EDIT CONTROL SYSTEM

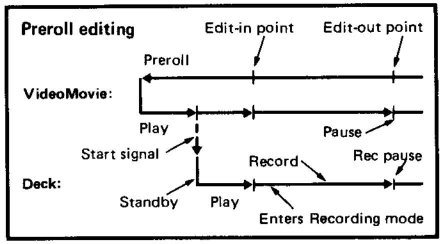
There are some VCRs which are not compatible with Master Edit Control. For these units, use the VCR's pause control to perform edit-in or edit-out functions.

This function is available when using **designated** JVC video decks equipped with a remote pause terminal. The Master Edit Control system allows control of the connected deck using the VideoMovie's controls, preroll editing for edits free of transition-point gaps and distortion.

Connection

1. Set the DUBBING ON/OFF switch to ON.
2. Connect the AV OUT connector of the GR-60E to the A/V IN connector and remote pause terminal of the video recorder.
3. Connect a television to the video recorder to monitor the picture while dubbing.





Operation

Dubbing can be initiated from Stop mode or Still mode.

●For dubbing a tape

1. Switch on the VideoMovie's power.
2. Switch on the deck's power.
3. Put the deck in the Record-Pause mode.
4. Press the QUICK REVIEW/EDIT button to start editing. The tape is loaded, then dubbing starts.
5. Tape stops when the PAUSE/STILL or STOP button of the GR-60E is pressed or counter reaches "M, 0".
6. Deck stops recording and enters the Record-Pause mode.

●For editing

1. Switch on the VideoMovie's power.
2. Turn on the deck's power.
3. Put the deck in the Record-pause mode.
4. Locate the edit-in point via play, fast-forward, rewind, or Shuttle Search, and press the PAUSE/STILL button.
5. Press the QUICK REVIEW/EDIT button to start editing.
6. Tape stops when the PAUSE/STILL or STOP button of the GR-60E is pressed or counter reaches "M, 0".
7. Deck stops recording and enters the Record-Pause mode.

Note:
When the EDIT button is pressed from the Still mode, the tape is rewound for 5 seconds of programme time. The Play indicator blinks on the LCD to indicate rewinding is taking place. After prerolling, first the prerolled section is played back for stabilizing tape run. During playback of the GR-60E, it gives a start signal to the deck standing by in the Record-Pause mode to start playback and then to enter the Recording mode at the edit-in point, while the GR-60E continues playback. The Master Edit Control indicator appears on the LCD during dubbing.

Setting the edit-out point using counter memory

In the above procedures, counter memory can be used to set the edit-out point before editing takes place, so that the VideoMovie automatically stops playback at the designated point. If the edit-out point is to be set in this way, do so following step 3 of the dubbing operation.

1. Locate the desired edit-out point on the VideoMovie's tape.
2. Press the VideoMovie's PAUSE/STILL button.
3. Reset the VideoMovie's counter to "0".
4. Press the VideoMovie's counter MEMORY button.
5. The VideoMovie enters the Pause mode, and the deck enters the Record-Pause mode.

Note:
When the tape reaches the preset edit-out point during the dubbing operation, it may stop slightly before or after the designated point on the tape.

INSERT EDITING

Insert editing means recording a new scene into a section of prerecorded tape so that a part of the original recording can be replaced with a new sequence without excessive picture distortion at the edit-in and edit-out points. In the Insert Edit mode, the original audio on the normal audio track remains unchanged.

1 Locate the desired edit-out point on the VideoMovie's tape and press PAUSE/STILL.

2 Press RESET to obtain a "0" reading, then press MEMORY to obtain an "M" indication on the LCD.

3 Press REW/SHUTTLE SEARCH to rewind the tape a little beyond the beginning of the scene your wish to insert.

4 Press PAUSE/STILL exactly at the beginning of the scene you wish to insert.

5 While holding INSERT/MONITOR pressed, press PAUSE/STILL. The INSERT indicator lights and the VideoMovie enters the Insert Edit mode with the scene at which the VideoMovie is aimed appearing on the screen for monitoring.

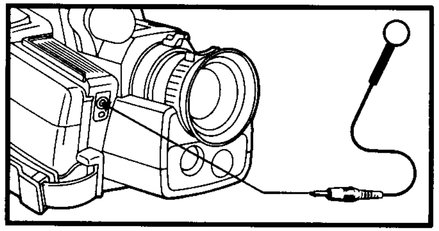
6 Press Recording start/stop to insert the new sequence.

7 When the counter reading of "0" is reached, insert editing stops automatically and the VideoMovie enters the Playback mode.

Notes:
- When the tape reaches the preset edit-out point during the editing operation, it may stop slightly before or after the designated point on the tape.
- Only video signals are recorded in the Insert Editing mode. When the sound is to be recorded, press the AUDIO DUB and PAUSE/STILL buttons simultaneously in the Insert Pause mode. When INSERT/MONITOR and PAUSE/STILL buttons are pressed simultaneously again, the unit reenters the video-signal-only recording mode.

AUDIO DUBBING

Audio dubbing means recording a new soundtrack on a pre-recorded tape, i.e., replacing the original sound with new audio material.



Precautions
- Tapes with their safety tabs removed cannot be audio dubbed. Reseal the safety tab slot to perform the dubbing.
- If whistling or howling is heard during audio dubbing, reduce the TV volume or move the mike farther away from the TV.
- When dubbing from a microphone
  Connect the microphone to the VideoMovie as shown on the left.

1 Locate the desired edit-out point on the VideoMovie's tape and press PAUSE/STILL.

2 Press RESET to obtain a "0" reading, then press MEMORY to obtain an "M" indication on the LCD.

3 Press REW/SHUTTLE SEARCH to locate more quickly the place on the tape you want audio dubbing to begin.

4 Press PAUSE/STILL at the exact beginning point for audio dubbing.

5 While pressing AUDIO DUB, press PAUSE/STILL to enter the Audio Dub Standby mode.

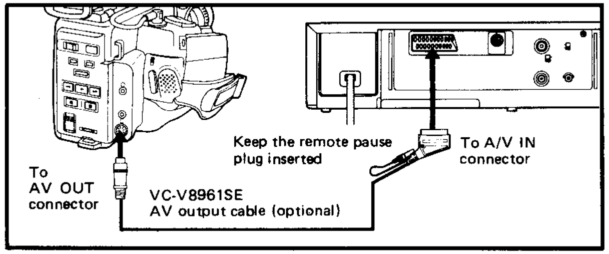
6 When you are ready with the new audio material, press PLAY to begin audio dubbing.

7 When the counter reading of "0" is reached, audio dubbing stops automatically and the VideoMovie enters the playback mode.

USING WITH ANOTHER RECORDER

For continuous documentation of longer events, the GR-60E can be used as an independent video camera in combination with either a deck-type or portable video recorder.

Using a recorder not equipped with a remote pause terminal
- Connect the AV OUT connector of the GR-60E to the A/V IN connector of the video recorder using the optional AV output cable VC-V8961SE.


Keep the remote pause plug inserted
To A/V IN connector
To AV OUT connector
VC-V8961SE
AV output cable (optional)

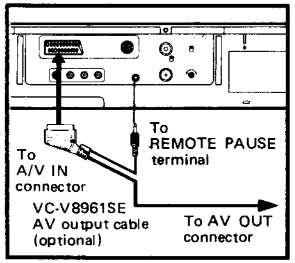
Operation
1. Press the INSERT/MONITOR button. The camera output signal is now available via the AV output cable.
2. Put the connected recorder in the Record mode. Recording will start. Tape start/stop should be controlled with the recorder's buttons.

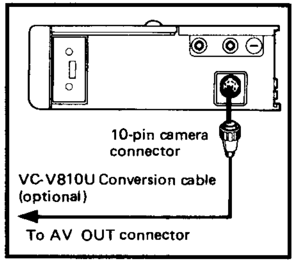
Note:
- In this configuration, it is possible to obtain a continuous recording and an edited-out recording of the same event simultaneously, because the GR-60E's start/stop button only controls the tape inside itself while another tape loaded in the connected recorder continues running. To record on the GR-60E's tape, follow the same recording procedure as described before: press REC Standby and then the start/stop button.

Using a recorder equipped with a remote pause terminal or with a 10-pin camera connector

For a recorder with a remote pause terminal
- Connect the AV OUT connector of the GR-60E to the A/V IN connector and remote pause terminal of the video recorder using the optional AV output cable VC-V8961SE.

For a recorder with a 10-pin camera connector
- Connect the AV OUT connector of the GR-60E to the 10-pin camera connector of the second recorder using the optional VC-V810U conversion cable.





Operation
1. Press the INSERT/MONITOR button.
2. Set the connected recorder in the Recording Standby (Record-Pause) mode.
   - The viewfinder's mode indication corresponds to the state of the connected recorder.
3. Press the start/stop button of the GR-60E to start recording.

Note:
- To record on the GR-60E's tape as well, press the REC standby button and then the start/stop button.

Precautions
- Power is not supplied to the GR-60E from the connected VCR. Independent power supply is required for both the GR-60E and the VCR.
- If you stop recording by pressing the GR-60E's start/stop button, the connected VCR also stops in the Pause mode. However, the pause command signal is not delivered to the connected VCR in the following cases and, therefore, the VCR will start automatically:
  (1) when the GR-60E is switched off or its battery becomes discharged.
  (2) when the VC-V810U cable is disconnected.

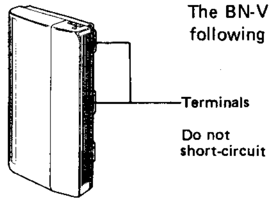
Therefore, before replacing the battery or tape for the GR-60E put the connected VCR either in the STOP or REC LOCK mode.

CHARGING THE BATTERY PACK

To charge the battery pack, use the exclusive AC power adapter/battery charger AA-V5EG (provided/optional) or car battery charger BH-V5E (optional).

Note:
The AA-V5EG AC power adapter/battery charger will accept 110 V to 240 V power supplies. Selection is automatic and no adjustment is required.

A WORD ON THE EXCLUSIVE BN-V5GU/V6GU/V7GU BATTERY PACKS



The BN-V5GU/V6GU/V7GU are nickel-cadmium batteries. Give attention to the following to make the most of their characteristics.

Temperature ranges-
The recharging time is based on room temperature of 20°C.
The lower the temperature, the longer the recharging time.

For charging: 10°C to 35°C
For operating: 0°C to 40°C
For storing: -10°C to 30°C

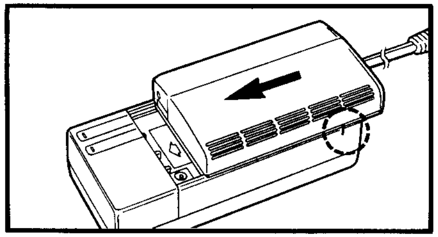
The battery pack has been kept in the uncharged state for shipment. Therefore, before use, charge it.
BE SURE TO CAREFULLY READ THE CAUTION ATTACHED TO THE BATTERY PACK.

Charging procedure

Charging time

BN-V5GU 50 min.	BN-V6GU 70 min.
BN-V7GU 80 min.	

- The charging time differs depending on the ambient temperature and the condition of the battery pack.



1 Connect the AC power cord to a wall outlet (The POWER indicator will light.)

2 Align the marks on the battery pack and adapter.

3 Slide the battery pack in the direction of the arrow until it locks in place.

4 When charging is completed, the CHARGE indicator goes out.

PRECAUTIONS
- If used near a radio, the provided AA-V5EG AC power adapter/battery charger may interfere with reception.
- Prevent inflammables, water and metallic objects from entering the unit.
- Do not disassemble or modify the unit.
- Do not apply shocks to the unit.
- Do not subject the unit to direct sunlight.
- Avoid using the unit in extremely hot or humid places.
- Avoid using the unit in places subject to vibrations.

Note:
The optional BH-V5E Car Battery Charger can charge the batteries from a car battery. For details refer to the instructions of the BH-V5E.

Recording time for the GR-60E

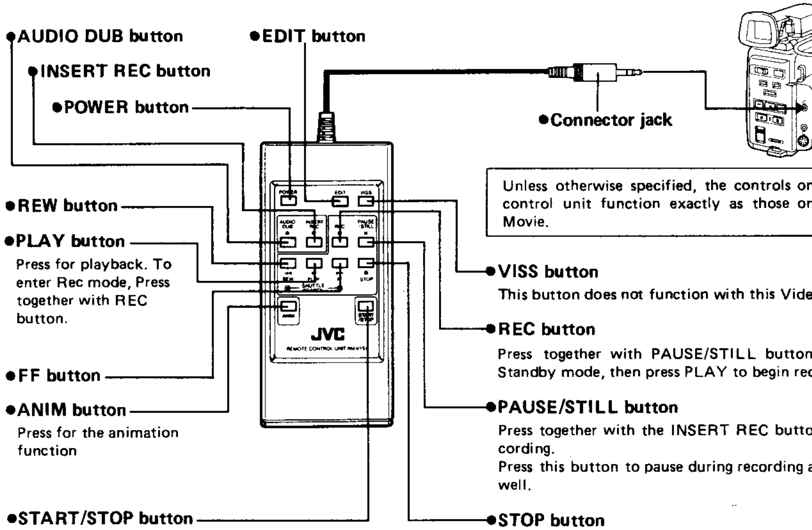
BN-V5GU 25 min.	BN-V6GU 60 min.
BN-V7GU 80 min.	

- The recording time per charge is influenced by the duration of recording standby, frequency of zooming, etc. It is safer to have spare battery packs.

USING THE REMOTE CONTROL UNIT (optional)

The remote control unit RM-V15U (optional) permits VCR functions to be controlled from a distance.

- Plug the remote control cable of the remote control unit into the remote connector on the VideoMovie.



- **AUDIO DUB button**
- **INSERT REC button**
- **POWER button**
- **EDIT button**
- **Connector jack**
- **REW button**
- **PLAY button**
  Press for playback. To enter Rec mode, Press together with REC button.
- **FF button**
- **ANIM button**
  Press for the animation function
- **START/STOP button**
- **VISS button**
  This button does not function with this VideoMovie.
- **REC button**
  Press together with PAUSE/STILL button to enter Rec Standby mode, then press PLAY to begin recording.
- **PAUSE/STILL button**
  Press together with the INSERT REC button for insert recording.
  Press this button to pause during recording and playback as well.
- **STOP button**

Unless otherwise specified, the controls on the remote control unit function exactly as those on the VideoMovie.

Note:
The Rehearsal mode cannot be engaged using this unit.

Animation function

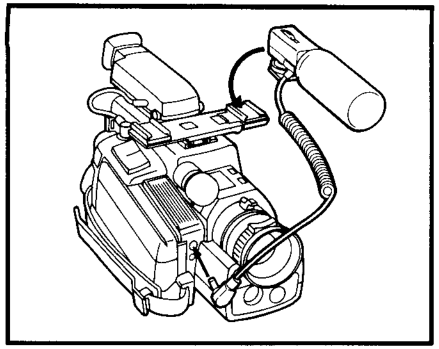
Animation produces the illusion of movement in otherwise stationary scenes or objects. This technique is accomplished by shooting a series of slightly different pictures of the same scene or slightly different poses of the same object for a brief period of about 1/2 second.

Operation
1. With the VideoMovie in the Record-Pause mode.
2. Press the ANIM button of the remote control unit RM-V15U.
   - Recording mode indicator and Pause mode indicator blinks alternately on the VideoMovie's LCD.
3. Press the Recording Start/Stop button or Play button after focusing the camera on a subject.
4. Recording stops automatically in the Record-Pause mode after about 1/2 second.
5. Repeat step 3 for the required number of shots.
6. Playback the recorded series to check if results were satisfactory.

Notes:
- The Animation mode can only be engaged from the Record-Pause mode.
- Before recording in the Animation mode at the very beginning of a tape, set the VideoMovie to the Record mode for about 5 seconds, in order that the tape runs smoothly. Using the Fade-in function at this point is a good way to begin an animated programme.
- During an Animation sequence, fading cannot be engaged.
- Release the Animation mode by pressing the ANIM button or the STOP button.
- If recorded background sound is undesirable, use the Audio Dubbing function to erase or replace it.
- When playing back an animated recording, the colour may be unstable with same TVs.

SHOE ADAPTER (optional)/ CARRYING HANDLE (optional)

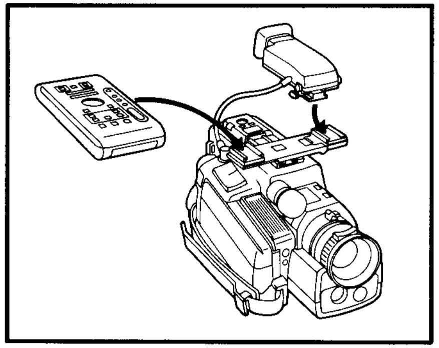
Attaching external microphone using shoe adapter.



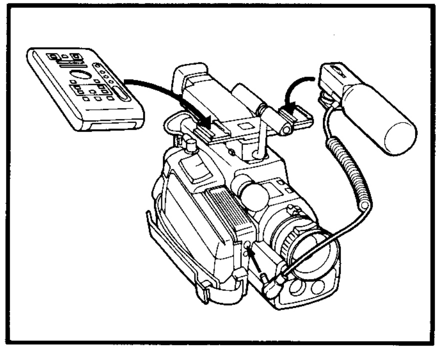
CAUTION
- Do not attach a video light, its heat could cause malfunctioning of the GR-60E.

Notes:
- Do not adjust the viewfinder angle while using a shoe adapter.
- Keep carrying handle in up position while attaching accessories.
- Run the microphone cord behind the shoe adapter.

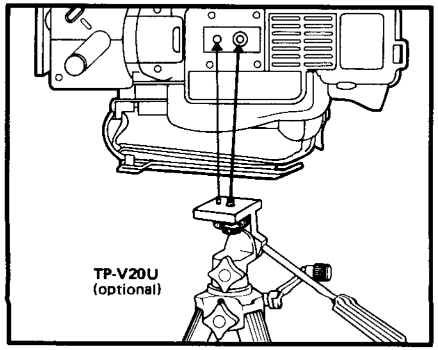
Attaching character generator using shoe adapter.



Attaching character generator and external microphone using shoe adapter and carrying handle.



TRIPOD MOUNTING



Align the screw and camera direction stud of the tripod with the camera's tripod mounting socket and stud hole, and firmly tighten the screw.

SUPPLEMENTAL INFORMATION

What is "colour temperature"?
Light is composed of various colour components in different proportions. A relationship exists between the temperature of a light source and the colour components of the emitted light; as the temperature rises, the colour of the light varies from red, orange, yellow, white to blue in that order. "Colour temperature" is a value that expresses differences in colour among light sources, measured in Kelvin degrees. Bluish light has a higher colour temperature than reddish light.

What is "white balance"?
Making the colours look natural on TV is what white balance is all about. Because a camera is not as adaptable as the human eye, if a light source is reddish, white subjects in that light are recorded as reddish. White balance adjustment is performed to compensate for colour temperature variations of light so that whites are reproduced as white. Correct white balance makes all other colours correct. The GR-60E can perform automatic white balance adjustment in the full-auto mode. However, if illumination is insufficient, white balance adjustment cannot be performed. To obtain correct colours, therefore, sufficient illumination is essential.

What is "illuminance"?
"Illuminance" (also called "luminance") is the intensity or brightness of light, expressed in lux. The GR-60E is designed to provide best pictures under the conditions of a 700-lux illuminance, although shooting is possible all the way down to 10 lux. To obtain good pictures in very bright light, the use of an ND (neutral density) filter is recommended. (See chart on this page.)

How to get good colour pictures
The simplest way is to provide sufficient lighting (close to the camera's reference illuminance) and accurately adjust the camera to the colour temperature of that lighting. If light sources of different colour temperatures are used together, accurate white balance adjustment is very difficult. For example, if natural light is mixed with artificial light, which is likely to occur next to windows, correct colours of the subject are difficult to obtain. It is recommended in such cases that curtains in the room be closed to shut out light from outside. Also, when artificial lighting devices are used, they should all have the same colour temperature. For example, it is recommended that incandescent or halogen lamps not be used together with fluorescent lighting.

Colour temperatures of various artificial lighting

Type of illumination		Colour temperature
Tungsten lamp for home use		2800 K
Tungsten lamp for photographic use		3200 K
Quartz-halogen lamp		
Blue lamp for photographic use		5000 K
Fluorescent lamp	Warm white	3500 K
	White	4500 K
	Daylight type	6500 K

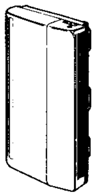
Illuminance chart
- The values on this chart are approximated to give you a rough reference.

	Unit: Lux	
ND filter desired	100,000	• Clear sky, mid-day, under sunlight (100,000)
		• Clear sky (10:00 a.m.) under sunlight (65,000)
Range for practical use		• Clear sky (2:00 p.m.) under sunlight (35,000)
		• Cloudy sky (mid-day) under sunlight (32,000)
		• Cloudy sky (10:00 a.m.) under sunlight (25,000
	10,000	
		• By the window during the afternoon (3,500)
	2,000	• Cloudy sky (one hour after sunrise) (2,000)
	1,000	• Clear sky (one hour before sunset) (1,000)
	600	• Counters at department stores (500 – 700)
Lighting desired	500	• Bowling centre (500)
		• Office under fluorescent light (400 – 500)
		• Library (400 – 500)
		• Direct light of a flashlight at 1 m distance (250)
	100	• Streetlight at night (150 – 200)
	80	
	Minimum lighting for an object	
	15	• Cigarette lighter (at a distance of 30 cm) (15)
	10	• Candlelight (at a distance of 20 cm) (10 – 15)

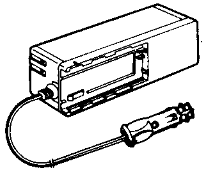
SYSTEMS FLEXIBILITY

For maximum enjoyment, make the most of the provided or optional accessories depending on the situation.

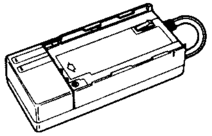
- **Regualr battery pack BN-V5GU**
  Pages 9 and 27
- **High-capacity battery pack BN-V6GU**
  Pages 9 and 27
- **Super High-capacity battery pack BN-V7GU**
  Pages 9 and 27



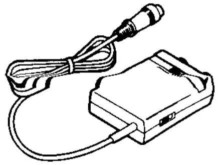
- **Car battery charger BH-V5E**
  Pages 9 and 27
  Use to charge the battery pack, or power the GR-60E using a car battery.



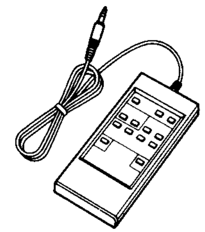
- **AC power adapter/battery charger AA-V5EG**
  Pages 9 and 27
  Use to power the GR-60E with household AC current or charge the battery pack.



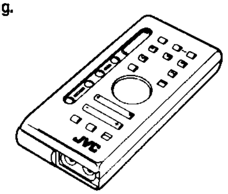
- **RF unit RF-V3E**
  Pages 22 and 23
  Use to connect the GR-60E to a regular TV receiver for playback.



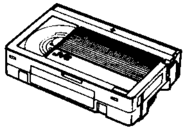
- **Remote control unit RM-V15U**
  Page 28
  Controls VideoMovie's VCR functions from a distance.



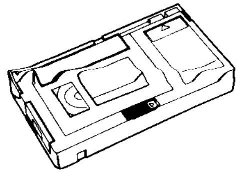
- **Character generator CG-P50E**
  Page 29
  Allows superimposition of titles, dates and lap time during recording.



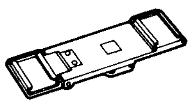
- **Compact video cassette EC-30**
  Page 3
  Allows 30 minutes of recording and playback.



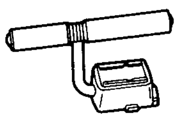
- **Cassette adapter C-P5U**
  Page 32
  Enables the EC-30 compact video cassette to be used with regular VHS machines.



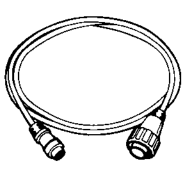
- **Shoe adapter CU-V410U**
  Page 29
  Use to attach microphone, character generator, etc.



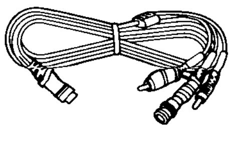
- **Carrying handle VU-V130U**
  Page 29
  Use to carry GR-60E.



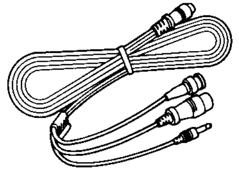
- **Conversion cable VC-V810U**
  Page 26
  For connecting the GR-60E to a VCR with a 10-pin camera connector.



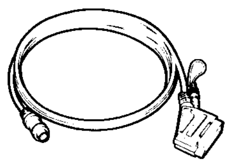
- **AV output cable VC-826E**
  Use to connect GR-60E to television set equipped with audio/video input connectors for playback, or to a second video recorder for dubbing.



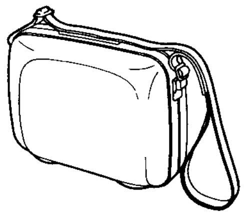
- **AV output cable VC-V856E**



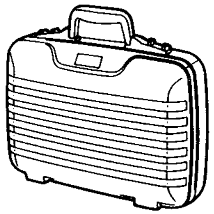
- **AV output cable VC-V8961SE**
  Pages 22, 23, 24 and 26
  Use to connect the VideoMovie to a TV or VCR equipped with a 21-pin connector for monitoring or dubbing/editing.



- **Carrying bag CB-V22U**
  Use to carry the GR-60E together with basic accessories.



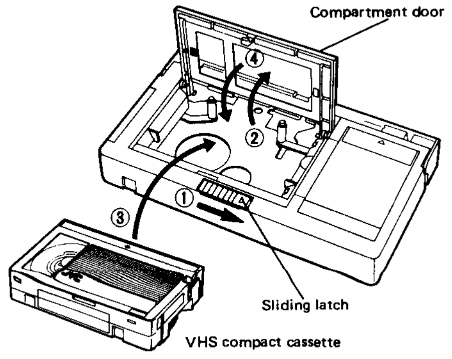
- **Carrying case CB-V32U**
  Use to carry the GR-60E together with accessories.



USING THE CASSETTE ADAPTER (provided)

The VHS compact video cassettes recorded with the GR-60E can be played back with a standard VHS machine by using the provided C-P5U Cassette Adapter.
(A compact video cassette installed in the cassette adapter is fully compatible with a standard VHS machine for both recording and playback.)

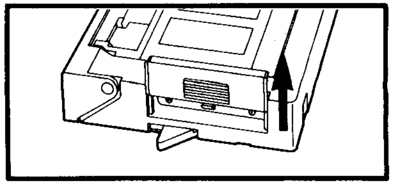
- **C-P5U Cassette Adapter**
  Being battery-operated, the C-P5U performs tape loading and unloading automatically.



Note:
- During special-effects playback (slow motion, still frame, etc.) the picture may vibrate or noise bars may appear on the screen.

- **Inserting the battery into the cassette adapter**

Remove the battery cover by sliding it up.
Install one "R6" battery and reattach the cover.



IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . . .

Symptoms	Check points
Power	
No power is supplied.	●Is the battery pack correctly installed? ●Is the battery pack charged? ●Is the power supply unit correctly connected? ●Is the POWER switch of the connected AC adapter set to ON?
Recording	
Recording is impossible.	●Check to see if the cassette safety tab is in place. See page 3.
Picture colours greatly differ from actual subject colours	●If in the manual white balance mode, check the setting of the ⌂/▭/☀ button.
No sound is recorded with an external microphone.	●Is the microphone's switch set to ON?
Recording does not start.	●Have you pressed the REC standby button first?
Playback	
Tape is running, but no playback picture appears.	●Is the VIDEO/TV switch of the RF unit set to VIDEO? ●Is the TV receiver set to your video channel?
Noise bars appear in the playback picture.	●Use the TRACKING control to reduce noise bars.
Tape transport	
Tape stops during fast forward or rewind.	●Is the "M" indication visible in on the LCD? If so, press the MEMORY button to cancel the memory function.
Rewinding or fast forwarding is impossible.	●Check to see if the tape has already been fully wound on one reel or the other.
Other	
No function is available with more than two mode indicators lit.	●If this should happen when using power supply units other than the battery pack, turn their POWER switch on and off. With a battery pack, replace it with another charged one.
Vertical white lines appear when shooting a very bright object.	●This may occur when the background contrasts very much with the object. This is normal.

The GR-60E is a microcomputer-controlled device. External noise and interference might prevent it from functioning properly. In such cases, first disconnect its power supply unit (battery pack, AC power adapter, etc.); and then reconnect it and proceed as usual from the beginning.

SPECIFICATIONS

Format : VHS standard
Power source : DC 9.6 V ⎓
Power consumption : 8.0 W
Signal system : PAL
Recording system : Luminance: FM recording
Colour: Converted sub-carrier direct recording
Conforms to VHS standard
Cassette : VHS-C cassette
Tape speed : 23.39 mm/sec
Recording time
Max. : 30 minutes (with EC-30 cassette)

VIDEO
Output : 1 Vp-p, 75 ohms, unbalanced (via AV OUT connector)
S/N ratio : More than 42 dB (with Rohde & Schwarz noise meter)

AUDIO
Output : -6 dBs, 1 k-ohm (via AV OUT connector)
Microphone input : -68 dBs, high impedance, unbalanced
Pickup : 1/2"-format CCD
Minimum required illumination : 10 lux (at F/1.4)
Illumination range : 10 – 100,000 lux
Lens : F/1.4 ~ 2.0, f = 9 – 54 mm, 6:1 two-speed power zoom lens with auto iris control and macro position, filter diameter 49 mm
Viewfinder : Electronic viewfinder with 0.6" black/white CRT
Selectable high-speed shutter : 1/250, 1/500, 1/1000 second
Colour temperature switching : Switchable (3,200 K/4,500 K/5,500 K)
White balance adjustment : Full-auto/preset standard
Operating temperature : 0°C to +40°C
Operating humidity : 35 % to 80 %
Storage temperature : -20°C to +50°C
Weight : 1.2 kg (with viewfinder)
Dimensions : 111(W) x 149(H) x 244(D) mm (incl. viewfinder)

AA-V5EG SPECIFICATIONS
Power requirement : AC 110 – 240 V∿, 50/60 Hz
Power consumption : 21 watts
Output : DC 14 V ⎓ 1.1 A (Charge)
DC 9.6 V ⎓ 1.2 A (VideoMovie)
Charging system : Constant current, peak detection, timer controlled
Dimensions : 68(W) x 38(H) x 150(D) mm
Weight : Approx. 380 g

C-P5U SPECIFICATIONS
Type : VHS cassette adapter
Dimensions : 188(W) x 25(H) x 104(D) mm
Weight : 240 g
Accessory : "R6"-size battery x 1

RF-V3E SPECIFICATIONS
Output channel : UHF channel 32 – 40 (adjustable)
Initial channel setting : UHF 36
Power source : DC 8 V ⎓ 20 mA (from VideoMovie)
Dimensions : 52(W) x 80(H) x 24(D) mm excl. cable
Cable length : 2.5 m
Weight : Approx. 160 g

Provided accessories:

AC power adapter/battery charger	AA-V5EG
Cassette adapter	C-P5U
Cassette tape	EC-30
Battery pack	BN-V6GU
RF unit	RF-V3E

Shoulder strap
Electric viewfinder
Lens cap
Lens hood
Battery for clock operation
Title easel
For optional accessories, refer to pages 31 and 32.

Design and specifications subject to change without notice.

SECTION 1
SERVICE CAUTION AND DISASSEMBLY

1.1 PRECAUTIONS

1. Disconnect the power from the set before removing/re-assembling or soldering components.
2. When removing/re-assembling fasteners such as screws, washers, be careful not to drop them into the mechanism.
3. When disconnecting/removing/re-assembling connectors, pay enough attention to wiring not do damage it.
4. In principle, resistors, shorting jumpers (0 ohm resistance), ceramic capacitors, diodes are all chip parts. These chip parts cannot be reused after they are once removed from the unit. (Refer to Section 1.3.)
5. When removing/re-assembling component parts, be careful not to damage them or displace other parts. (Be especially careful about the video head ass'y and the tape transport mechanism.)
6. Pay enough attention to the CCD image sensor and optical filters so that they won't be dusty, soiled or damaged. If it is soiled with fingerprints, etc., clean gently with silicon lens tissue or chamois.
7. When removing ICs, be careful not to damage circuit patterns. (This also applies to do re-assembling.)

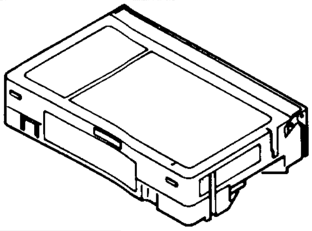
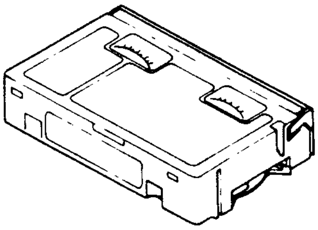
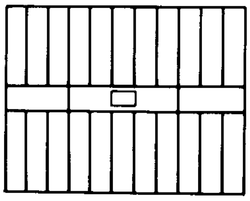
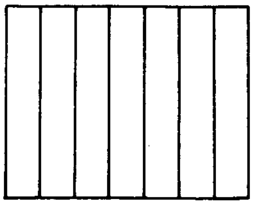
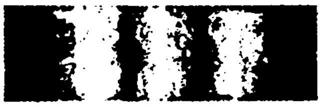
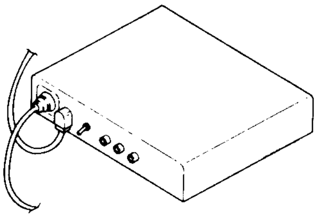
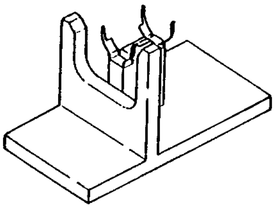
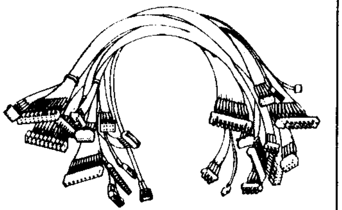
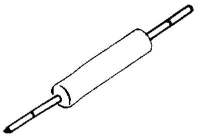
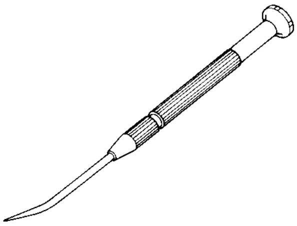
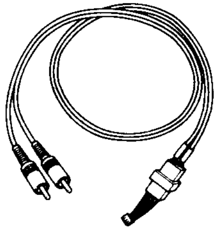
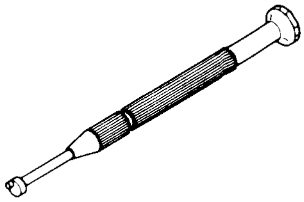
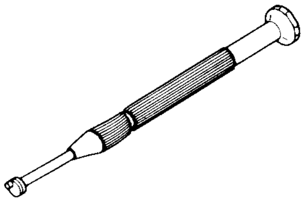
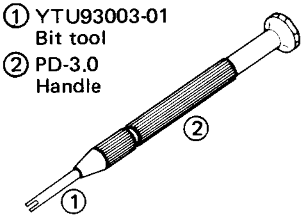
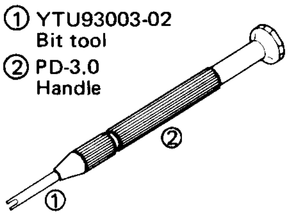
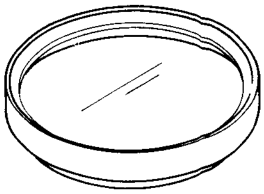
1.2 REQUIRED TEST EQUIPMENTS, FIXTURES/TOOLS AND OTHERS

For proper measurement, adjustment and maintenance, the following test equipment, fixtures/tools are strongly recommended.

1.2.1 Test equipment

1. Oscilloscope (dual-trace, more than 20 MHz)
2. Vectorscope
3. Frequency counter
4. Audio tester
5. Color video monitor
6. Halogen lamps

1.2.2 Special test equipment and tools required for adjustments

Alignment tape (MH-C2)	Cassette torque meter PUJ50431-2	Grey scale pattern (GS-2A) Reflection type, 11 steps, $\gamma = 2.2$	Color bar pattern (CC-2A) Reflection type, 7-color
			
Back focus adjustment chart PUJ93944	Y/C separator PUJ25579-2	Camera adjust stand YTU93010A-2	Patching cord YTU93025A
			
Adjustment jig for compact VTR YTU93004-2	Chip IC replacing tool PTS40844	Y/C separator tool YTU93006	Back focus adjustment handle PUJ37186A
			
Auto focus unit Back focus adjustment handle PUJ37186B	Chip parts replacement jig ass'y YTU93003A	Chip parts replacement jig ass'y YTU93003B	Color temperature conversion filter (PUJ53340A-C2,C4,C8,W2,W4,W8)
	① YTU93003-01 Bit tool ② PD-3.0 Handle 	① YTU93003-02 Bit tool ② PD-3.0 Handle 	
Color compensating filter - CC10Y (CC10Y filter made by Kodak)			
This filter is CC10Y in Kodak.			

1.3 REPLACEMENT OF CHIP PARTS

For replacing chip parts, proceed it as follows.
Use a well insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temp.).
In addition, it is recommended to use a soldering iron (55 W approx.) with solder absorber for convenience.

Caution:
- Do not apply heat for more than 3 seconds.
- Do not rub electrodes.
- Do not reuse chips removed once. Discard them.
- Supplementary cementing is not required.

1.3.1 Soldered condition of chip parts

- Resistors, capacitors, etc.

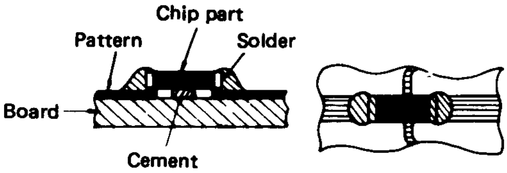


Fig. 1-3-1 Soldering condition-1

- Transistors, diodes, etc.

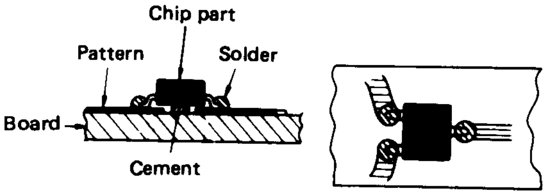


Fig. 1-3-2 Soldering condition-2

1.3.2 How to remove chip parts

- Resistors, capacitors, etc.

1. Set a chip parts replacing tool onto the chip parts to hold it down.
2. Unsolder at a side of the chip parts.

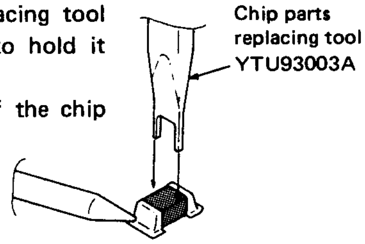


Fig. 1-3-3 R/C removal-1

3. Remove the chip parts by twisting and sliding it.

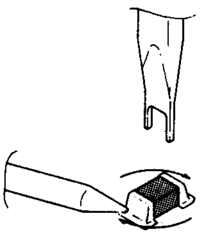


Fig. 1-3-4 R/C removal-2

- Transistors, diodes, etc.

1. Unsolder at the one-lead side of the chip parts.

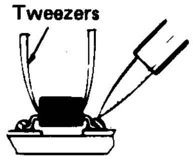


Fig. 1-3-5 Tr/Diode removal-1

2. Lift the unsoldered side upwards.

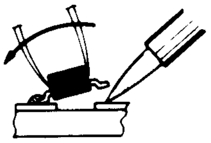


Fig. 1-3-6 Tr/Diode removal-2

3. Heat the other two leads simultaneously and remove the chip parts upwards.

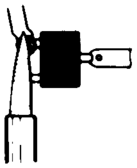


Fig. 1-3-7 Tr/Diode removal-3

1.3.3 Preheating and soldering

When setting new chip parts, especially capacitors, but except transistors, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes just before solderingg. For soldering, use a soldering iron of 30 W approx.

1.3.4 How to set and solder chip parts

1. Presolder the contact points of the circuit pattern, to which the chip parts will be soldered.

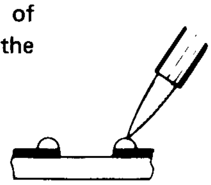


Fig. 1-3-8 Soldering-1

2. Holding down the chip parts with the chip parts replacing tool, solder it with a soldering iron.

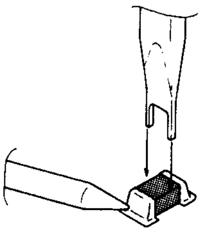


Fig. 1-3-9 Soldering-2

1.4 REMOVING OF FLAT ICs

(Recommendable manner)

1. For removing solder chips from IC's pins, use a solder remover or a wiry solder absorber.
2. Heat the IC's tips evenly by moving the chip IC replacing jig around them, and detach the IC's leads with a tool in the way of using a lever.
3. Do not reuse ICs removed once. (Discard them.)

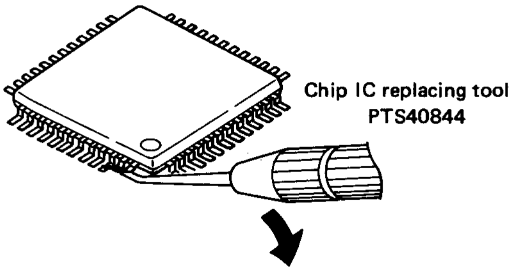


Fig. 1-4-1 Flat IC removal

1.5 DISASSEMBLY OF CAMERA SECTION

For servicing (including parts replacement) of the camera section with ease, follow the procedures in the order of descriptions with illustrations that are easy to understand the whole structure of the VideoMovie besides sectional parts layout.

1.5.1 Electronic viewfinder (E. VF)

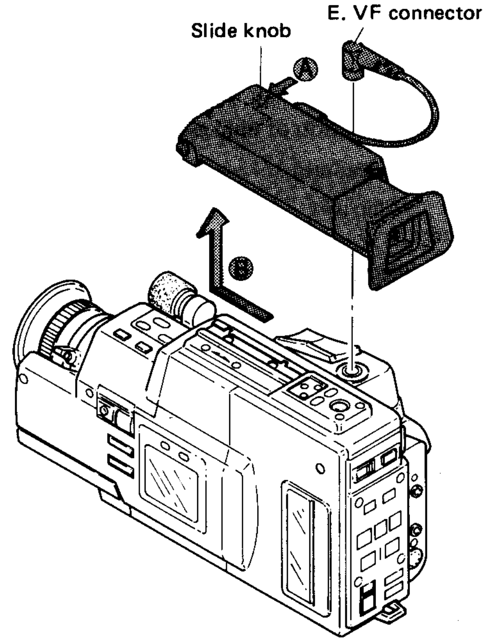


Fig. 1-5-1 Electroniv viewfinder

1. Disconnect the E. VF connector from the main body first, then, pushing the slide knob Ⓐ in the direction of the arrow mark, slide the E. VF in the direction of the arrow mark Ⓑ to take it off.

1.5.2 E. VF shoe & Deco plate

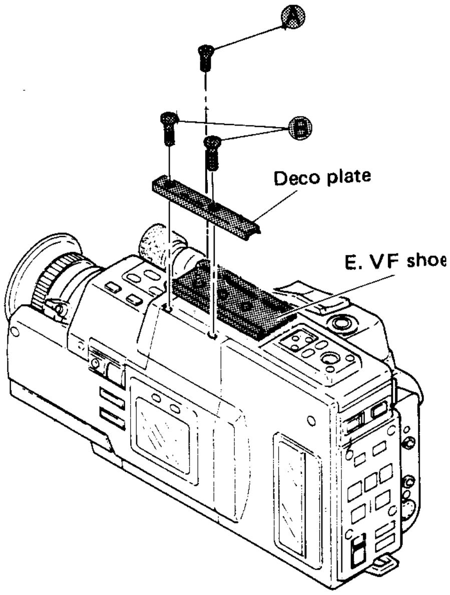


Fig. 1-5-2 E. VF shoe cover

1. Remove the screws Ⓐ and Ⓑ and take off the E. VF shoe and Deco plate.

1.5.3 Cassette cover

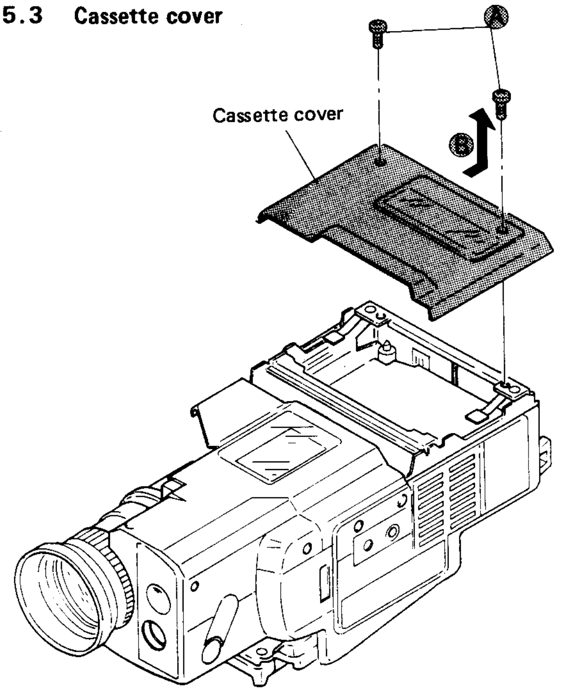

Ⓐ
Cassette cover
Ⓑ

Fig. 1-5-3 Cassette cover

1. After removing the screws Ⓐ, take off the cassette cover by sliding it in the direction Ⓑ.

1.5.4 Upper case & Front cover

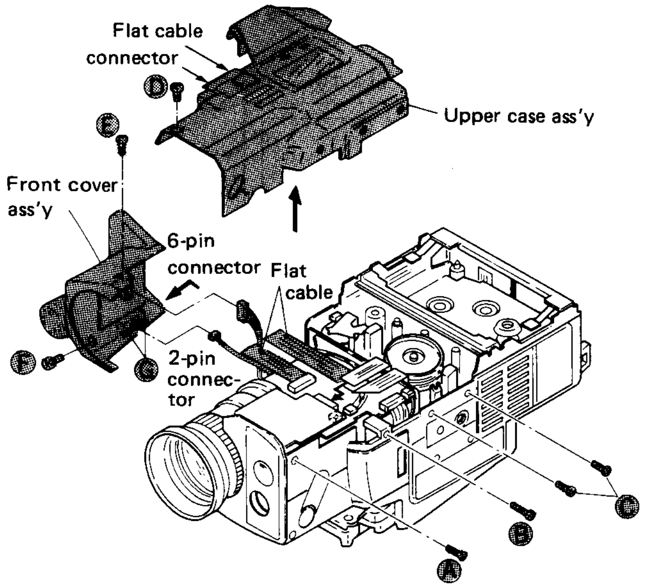

Flat cable connector
Ⓓ
Upper case ass'y
Ⓔ
Front cover ass'y
6-pin connector
Flat cable
2-pin connector
Ⓕ
Ⓖ
Ⓒ
Ⓑ
Ⓐ

Fig. 1-5-4 Upper case and front cover

1. Remove the screws Ⓐ, Ⓑ, Ⓒ, Ⓓ, Ⓔ and Ⓕ.
2. Take off the upper case and front cover by pulling them in the directions of the arrow marks respectively.
3. Disconnect the 2-pin and 6-pin connectors gently from the front cover, and remove the screws Ⓖ to take off the mic assembly.
4. The upper case and the main body are connected with a flat cable. Unlock its connection first and disconnect it from the upper case to separate them.

1.5.5 Front panel

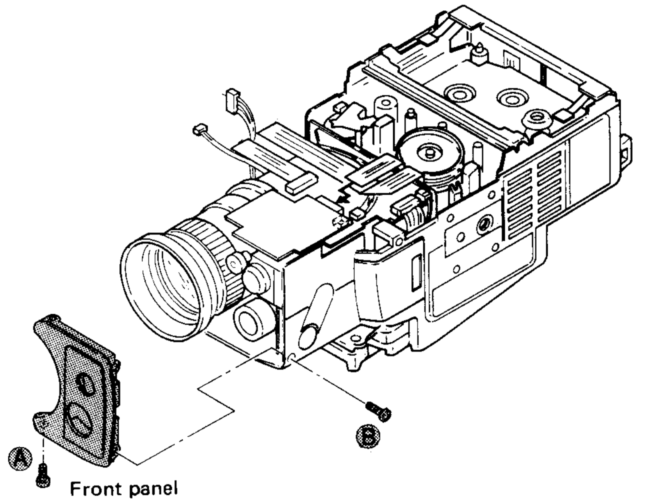

Ⓑ
Ⓐ
Front panel

Fig. 1-5-5 Front panel

1. Remove the screws Ⓐ and Ⓑ and take off the front panel.

1.5.6 Base assembly

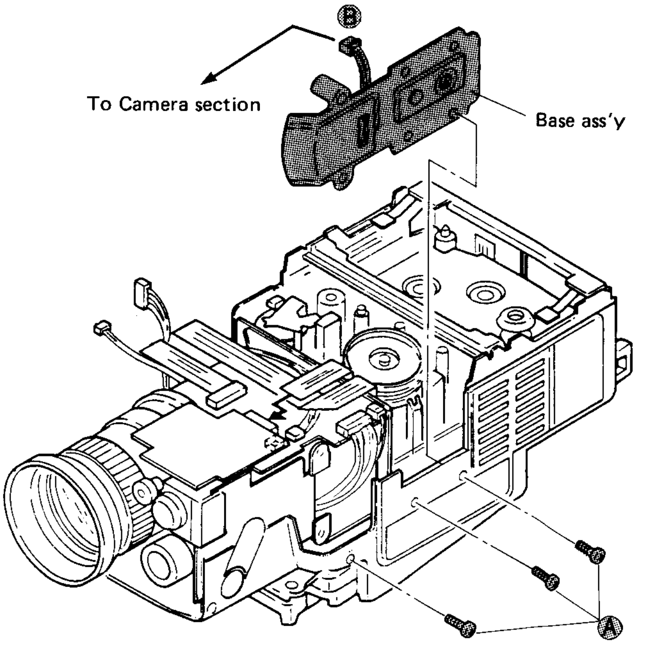

Ⓑ
To Camera section
Base ass'y
Ⓐ

Fig. 1-5-6 Base ass'y

1. Remove the screws Ⓐ and disconnect the connector Ⓑ to take off the base ass'y.

Note: The connector Ⓑ is connected to CN409 of the IND (indicator) board of the camera section (see Fig. 1-5-7).

1.5.7 Camera section

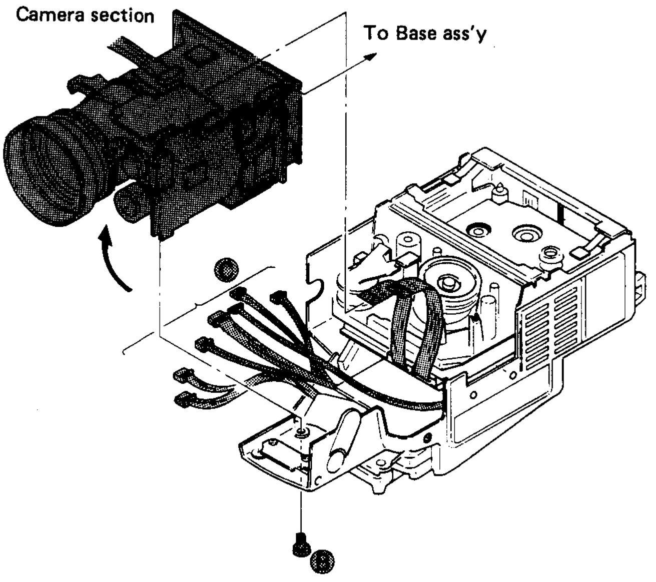
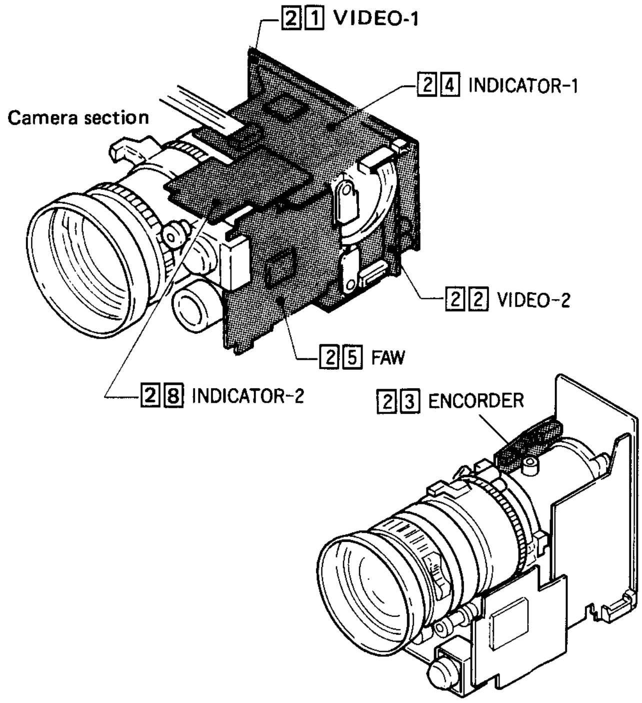

Camera section
To Base ass'y

Fig. 1-5-7 Camera section

1. Remove the screw Ⓑ and disconnect connectors and flat cables Ⓒ, then gently draw the camera section out of the lower case.

1.5.8 P.C. boards of the camera section

- **Names of boards**


21 VIDEO-1
24 INDICATOR-1
Camera section
22 VIDEO-2
25 FAW
28 INDICATOR-2
23 ENCORDER

- Camera section disassembled from the lower case ass'y

Fig. 1-5-8 Boards of the camera section

1.5.9 Setup for troubleshooting and checkup of the camera section

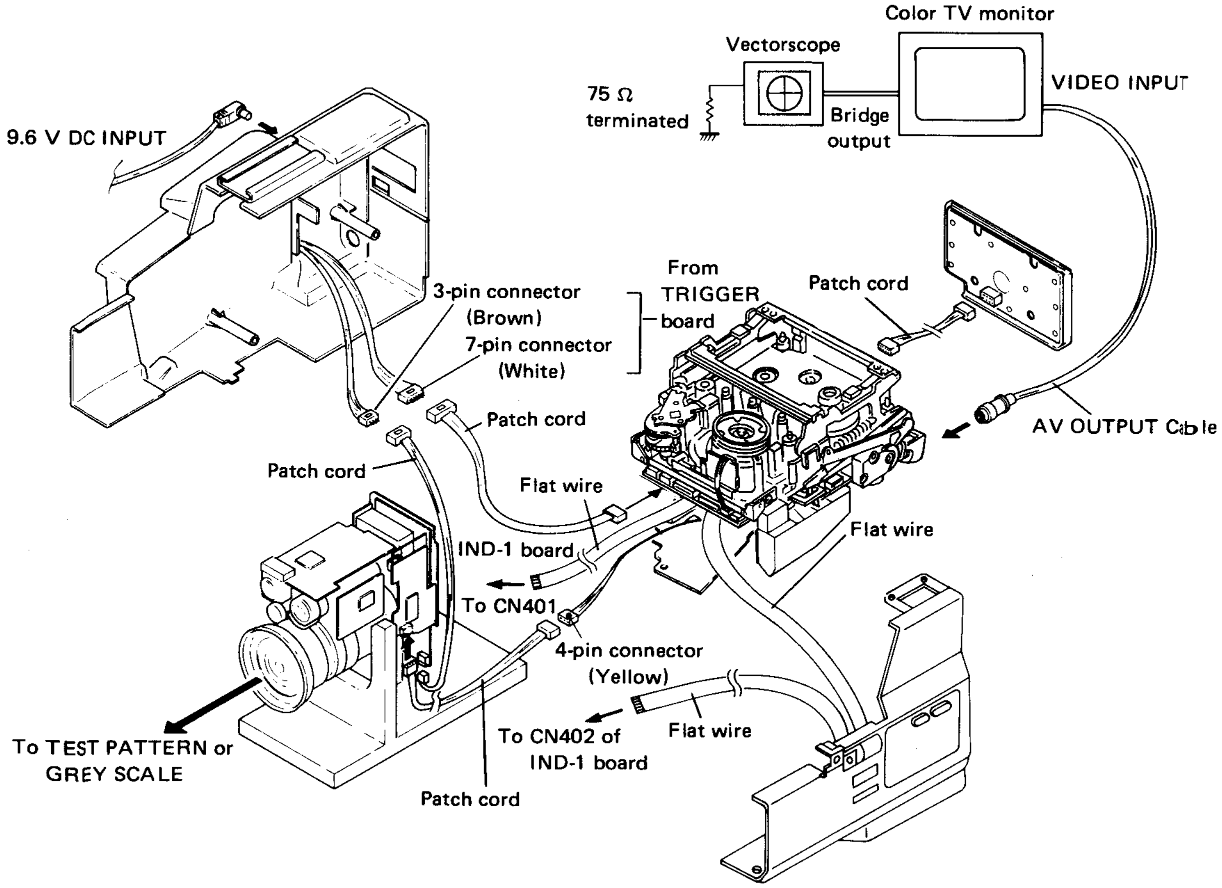

Color TV monitor
Vectorscope
75 Ω terminated
Bridge output
VIDEO INPUT
9.6 V DC INPUT
3-pin connector (Brown)
7-pin connector (White)
From TRIGGER board
Patch cord
Patch cord
Patch cord
AV OUTPUT Cable
Flat wire
Flat wire
IND-1 board
To CN401
4-pin connector (Yellow)
To TEST PATTERN or GREY SCALE
To CN402 of IND-1 board
Flat wire
Patch cord

Fig. 1-5-9 Setup of the camera section

1.5.10 FAW & Indicator-2 boards

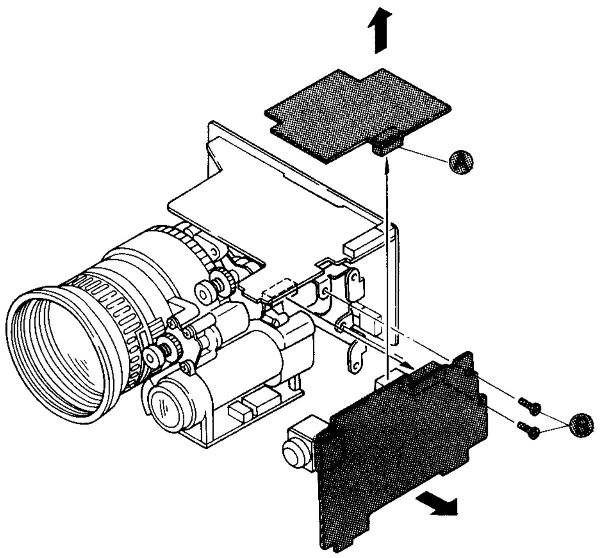


Fig. 1-5-10 Removing of P.C. boards (1)

1. Disconnect the connector Ⓐ and take off the Indicator-2 board by drawing it out in the direction of the arrow mark (upward).
2. Remove the screws Ⓑ and draw out the FAW board in the direction of the arrow mark (rightward) to take it off.

1.5.11 Indicator-1 & Encoder boards

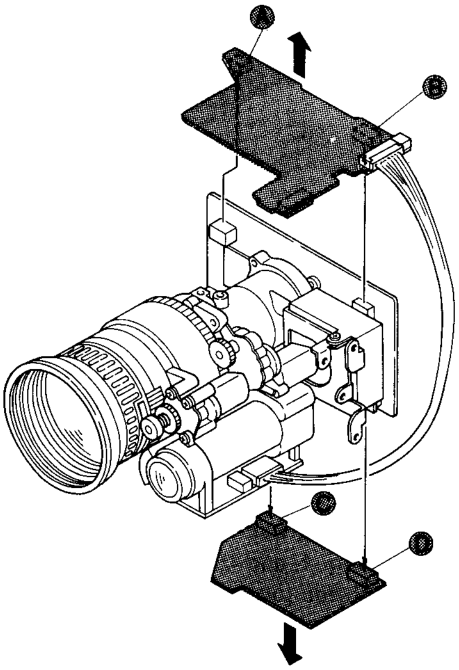


Fig. 1-5-11 Removing of P.C. boards (2)

1. Disconnect the connectors Ⓐ, Ⓑ, Ⓒ and Ⓓ, and draw out the Indicator-2 and Encoder boards in the respective directions of the arrow marks to take them off.

1.5.12 DC-DC converter & Video-2 board

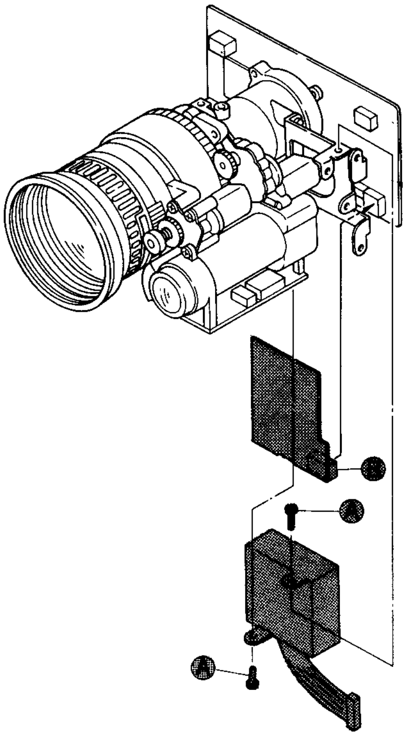


Fig. 1-5-12 Removing of P.C. boards (3)

1. Remove the screw Ⓐ and disassemble the DC-DC converter from the optical bracket.
2. Disconnect the connector Ⓑ and remove the Video-2 board from the Video-1 board.

1.5.13 Replacement of image sensor

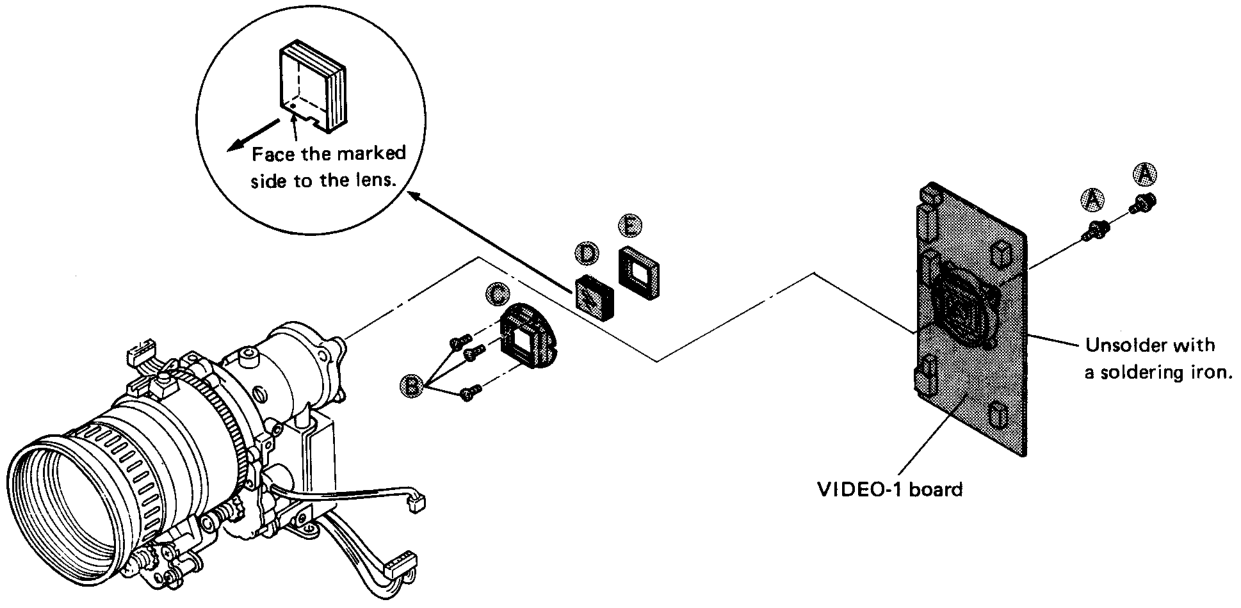

Face the marked side to the lens.
Ⓐ
Ⓐ
Ⓔ
Ⓓ
Ⓒ
Ⓑ
Unsolder with a soldering iron.
VIDEO-1 board

Fig. 1-5-13 (A) Removing of image sensor (1)

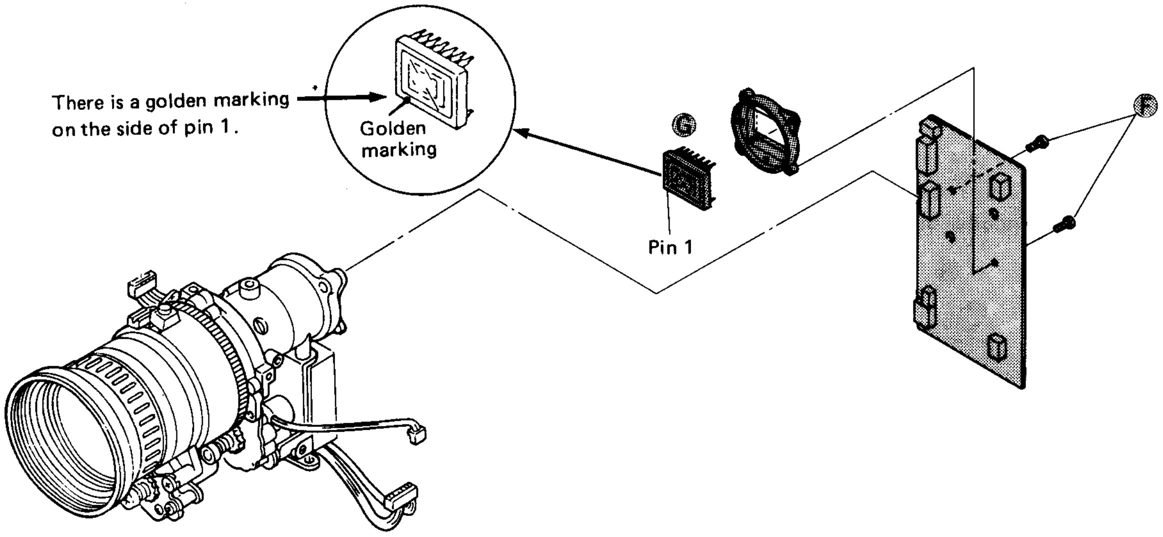


Fig. 1-5-13 (B) Removing of image sensor (2)

- **Disassembly of image sensor from optical block**

1. Remove the screw Ⓐ and take off the Video-1 board together with the imager holder.
2. Remove the screws Ⓑ and take the optical LPF holder Ⓒ, optical LPF Ⓓ and space rubber Ⓔ to respective pieces.
3. Unsolder the CCD image sensor and remove the screws Ⓕ, then take off the CCD image sensor Ⓖ.

- **Installing a new image sensor**

4. After removing the protection seal from a new CCD image sensor Ⓖ, install it to the Video-1 board.
   At that time, make sure to set it so that the marking on the side of pin 1 is positioned on the left bottom as viewed in the figure.
5. After the CCD image sensor is set on the Video-1 board, secure it by soldering. Be careful not to apply excessive heat to the sensor and the board.
6. Next, set the space rubber Ⓔ, optical LPF Ⓓ (to face the marking to the lens), optical LPF holder Ⓒ one after another and secure them with three screws Ⓑ.
7. Install the Video-1 board together with the imager holder to the optical block, and temporarily fix it with two screws Ⓐ so lightly as it can be moved.
8. Install the Indicator-1, and -2 boards and encoder board. Picking up an object (test pattern) in the macro-focus, adjust setting position of the Video-1 board so that no vignetting is observed at any corner of the image.
   Next, make sure of horizontality of the image by eyes. If it is confirmed that the image is kept nearly horizontally by fine-adjustment, tighten the two screws Ⓐ.
9. After all of the above works for the replacement, perform the specific adjustments of the camera section.

1.5.14 Zoom motor, Focus motor

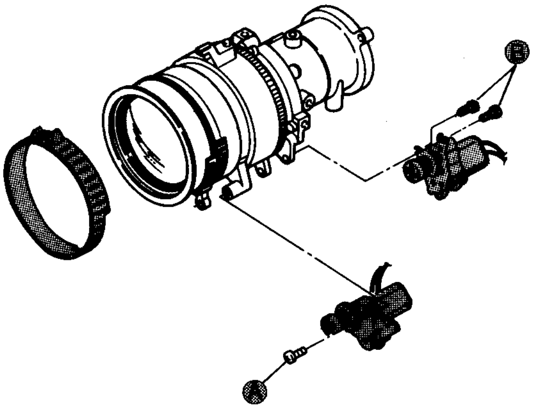


Fig. 1-5-14 Zoom and focus motors

1. Remove the screw Ⓐ and detach the focus motor from the lens unit.
2. Remove the screws Ⓑ and detach the zoom motor from the lens unit.

1.5.15 AF unit

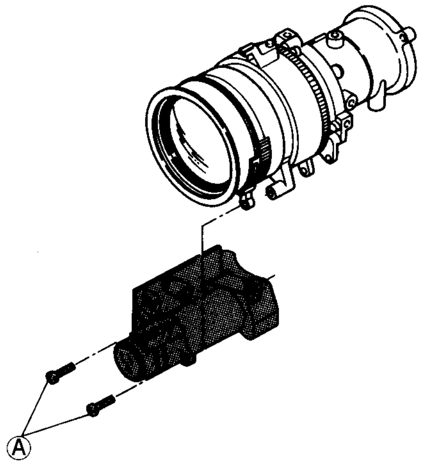


Fig. 1-5-15 AF unit

1. Remove the screws Ⓐ and detach the AF unit from the lens unit.

1.5.16 Operation unit & shoe bracket

Note: Make sure to remove the operation unit and shoe bracket before disassembling the deck section.

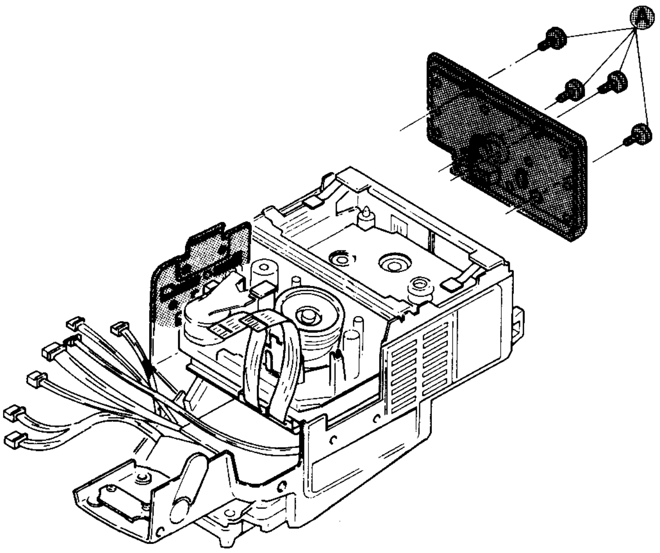


Fig. 1-5-16 Operation unit and shoe bracket

1. Remove the screws Ⓐ and take off the operation unit.
2. The shoe bracket can be removed easily by twisting the lower case in the direction of the arrow mark.

1.5.17 Screws securing the deck section

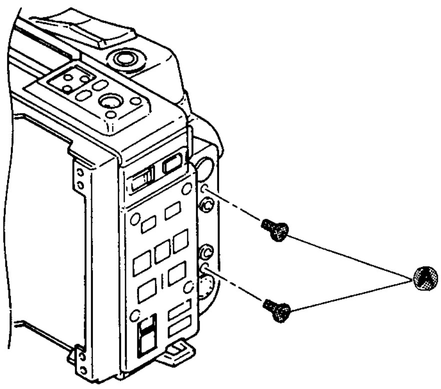


Fig. 1-5-17 Screws securing deck section

1. Remove the screws Ⓐ which secure the deck section at the lower part of the respective plugs of the A/V input connector.

1.6 DECK SECTION

1. Remove the screws Ⓐ, Ⓑ and Ⓒ.
2. Disconnect the connectors Ⓔ and Ⓕ.
   Lift the deck section by the part near the cassette housing upward, then gently draw it out in the direction of the arrow mark.

Remove the Ⓐ, Ⓑ

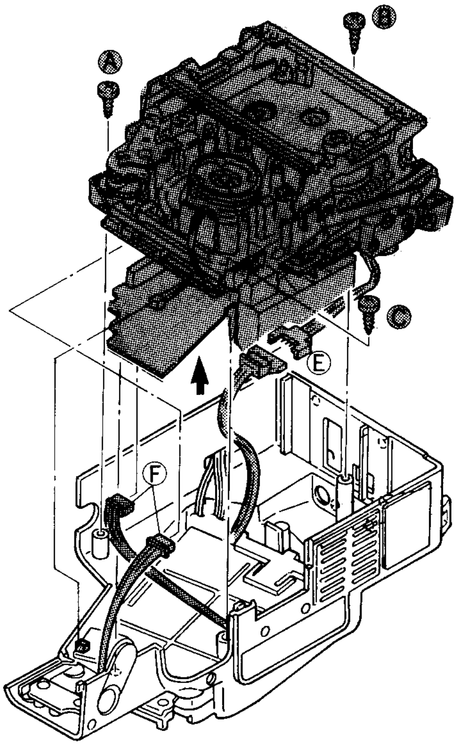


Fig. 1-6-1 Exposured deck section

1.6.1 Setup for troubleshooting and check up of deck section

1. For operating only the deck section disassembled from other units for checkup and troubleshooting, connect patch cords Ⓐ, Ⓑ and Ⓒ, and supply 9.6 V DC to start it.

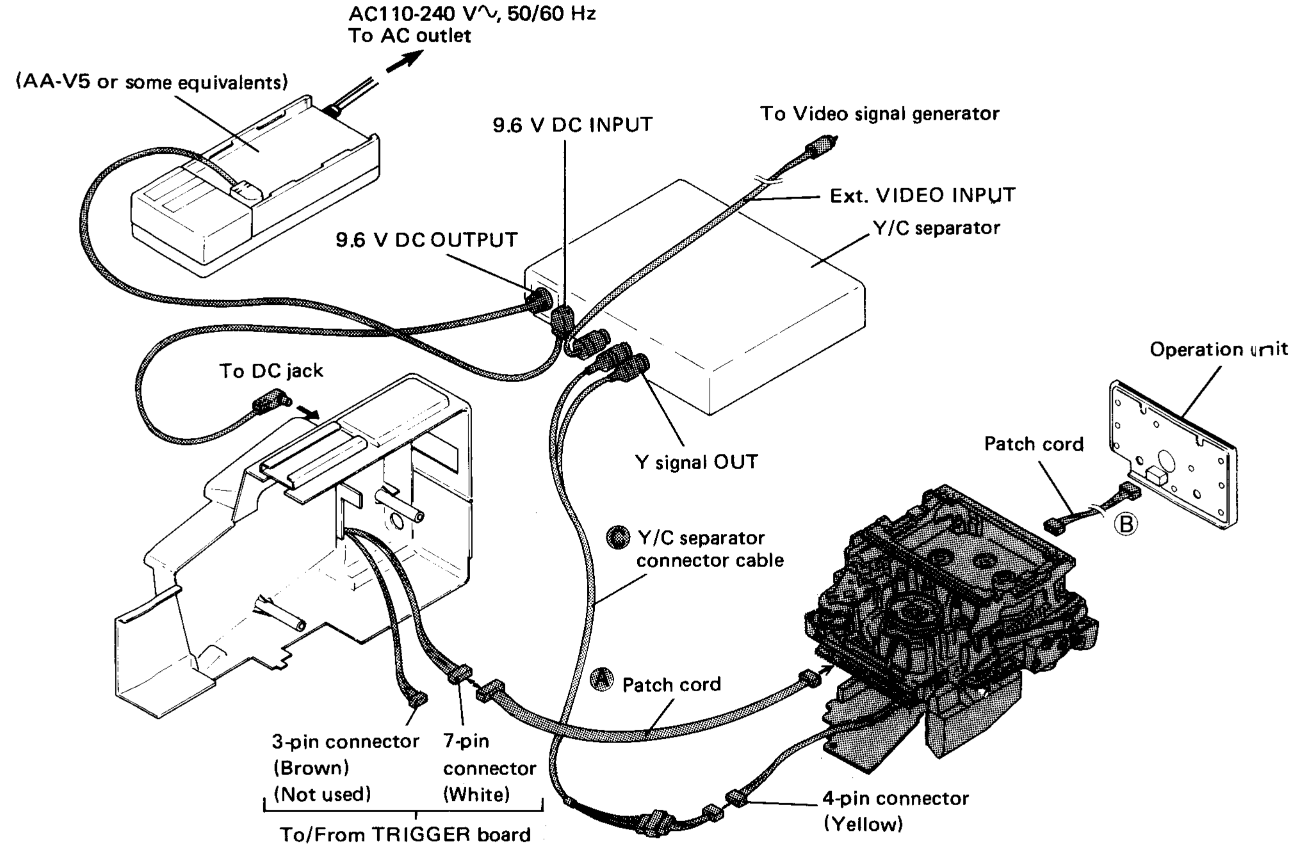

AC110-240 V∿, 50/60 Hz
To AC outlet
(AA-V5 or some equivalents)
9.6 V DC INPUT
To Video signal generator
Ext. VIDEO INPUT
Y/C separator
9.6 V DC OUTPUT
Operation unit
To DC jack
Patch cord
Ⓑ
Y signal OUT
Ⓒ Y/C separator connector cable
Ⓐ Patch cord
3-pin connector (Brown) (Not used)
7-pin connector (White)
To/From TRIGGER board
4-pin connector (Yellow)

Fig. 1-6-2 Stamdard setup for deck section adjustment

1.6.2 Y/C board

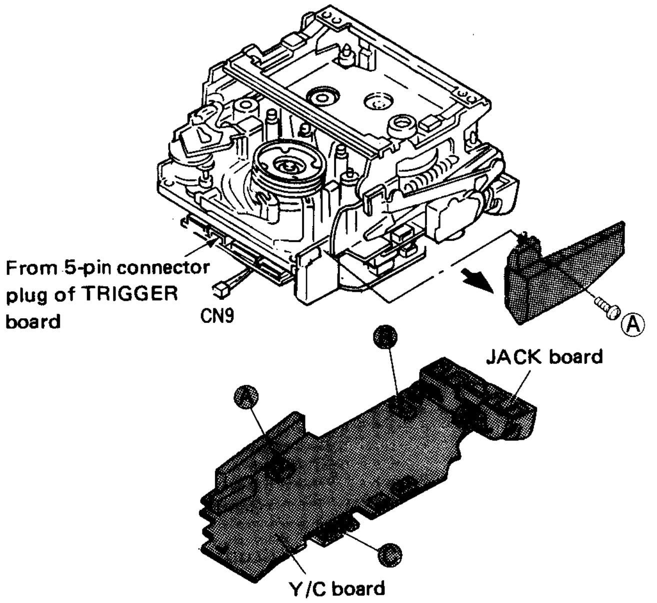

From 5-pin connector plug of TRIGGER board
CN9
Ⓐ
JACK board
Y/C board

Fig. 1-6-3 Y/C board

1. Remove the screw Ⓐ and draw out the PREAMP board in the direction of the arrow mark to take it off.
2. Disconnect the connectors Ⓐ, Ⓑ and Ⓒ by pulling them in the direction of the arrow mark, then the Y/C board can be taken off.

1.6.3 Sensor board and Cassette housing

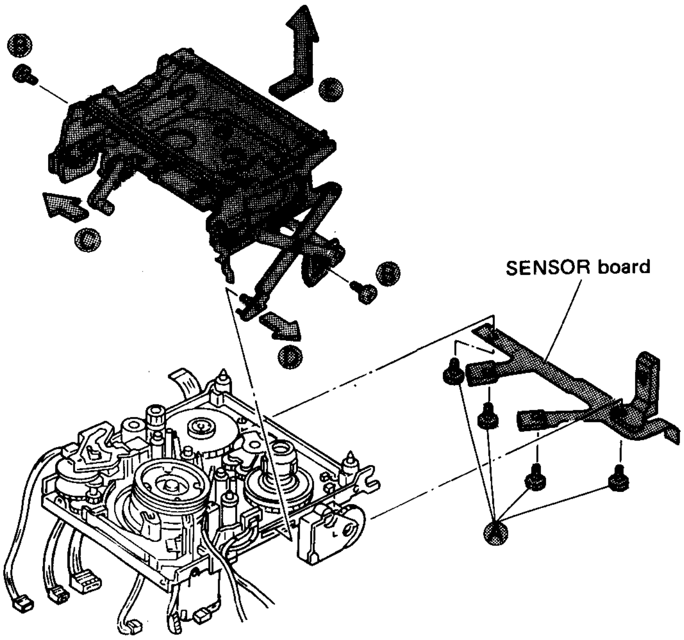

SENSOR board

Fig. 1-6-4 Cassette housing and sensor board

1. Remove the screws Ⓐ, and take off the sensor board.
2. Remove the screw Ⓑ, and expand the stays of the cassette housing in the directions of Ⓒ and Ⓓ to disengage the rods. Then take off the cassette housing by lifting it in the direction of Ⓔ.

1.6.4 Main board

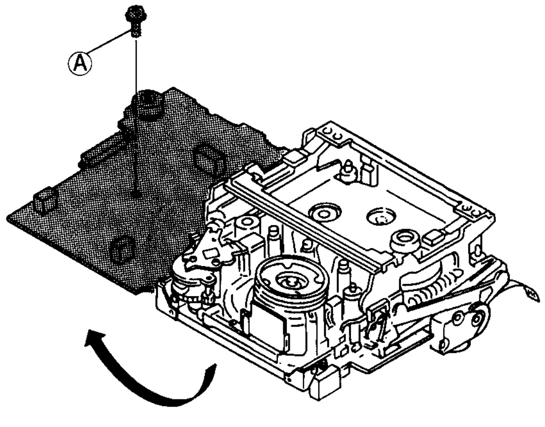


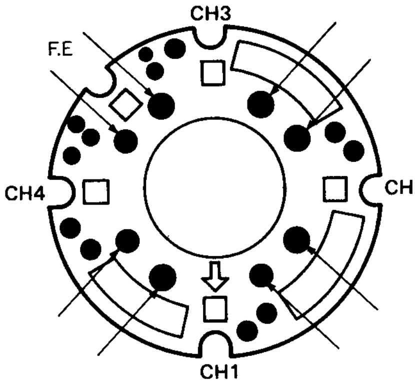
Fig. 1-6-5 Main-3 board

1. Remove the screw Ⓐ and open the MAIN-3 board as indicated by the arrow in the figure.

1.6.5 Replacement of upper drum

Note: At replacing the upper drum, be careful not to touch the head of a new upper drum as well as not to scratch and damage the drum.

1. Unsolder eight soldered points (indicated by arrow marks in the figure) near the center of the upper drum surface, and remove two screws.


CH3
F.E
CH4
CH2
CH1

(Big arrow mark indicates the position of CH1.)

Fig. 1-6-6 Upper drum removal-1

2. To remove the existing upper drum, set a jig provided with a new upper drum as shown in Fig. 1-6-7.

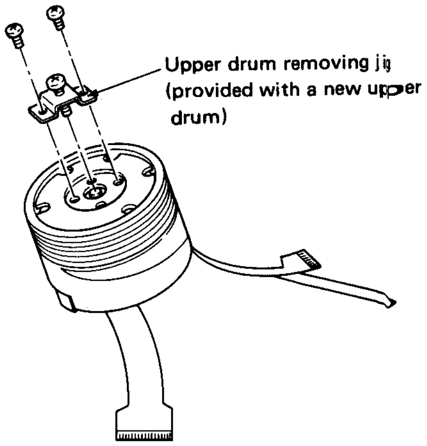

Upper drum removing jig (provided with a new upper drum)

Fig. 1-6-7 Upper drum removal-2

3. Prior to attaching a new upper drum, insert a hot soldering iron (50 W) into the drum's hole for 3 to 5 minutes to expand it by heating.

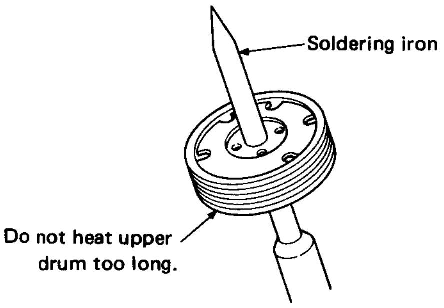

Soldering iron
Do not heat upper drum too long.

Fig. 1-6-8 Upper drum installation-1

4. Correctly set a new upper drum so that the drum's CH2 hole and the lower drum's hole (see Fig. 1-6-6) fit with each other.

Note:

1) Before assembling the upper drum and lower drum, make sure to clean each contact surface with alcohol.
2) The CH1 hole is indicated by an arrow mark on the upper drum board. (in shown in Fig. 1-6-3.)

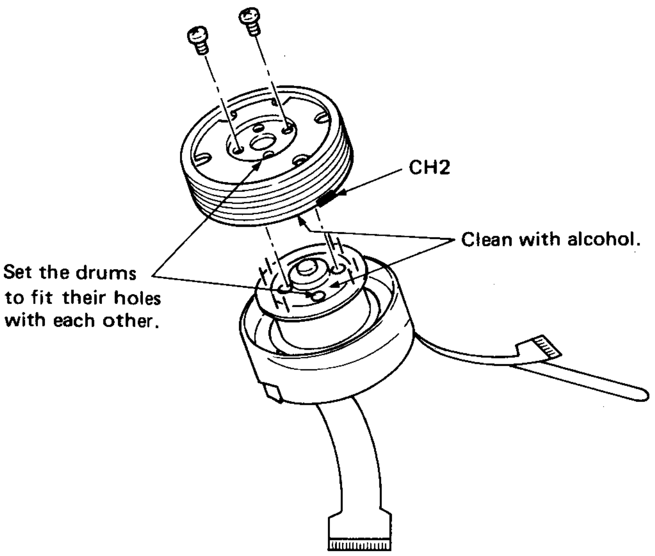

CH2
Clean with alcohol.
Set the drums to fit their holes with each other.

Fig. 1-6-9 Upper drum installation-2

5. For fixing the upper drum, temporarily tighten two screws first, and after the drum has got cold tighten them alternately to secure the drum.
6. After replacement of the upper drum, make sure to check up and adjust the tape transport and electric systems.

1.6.6 How to replace drum assembly

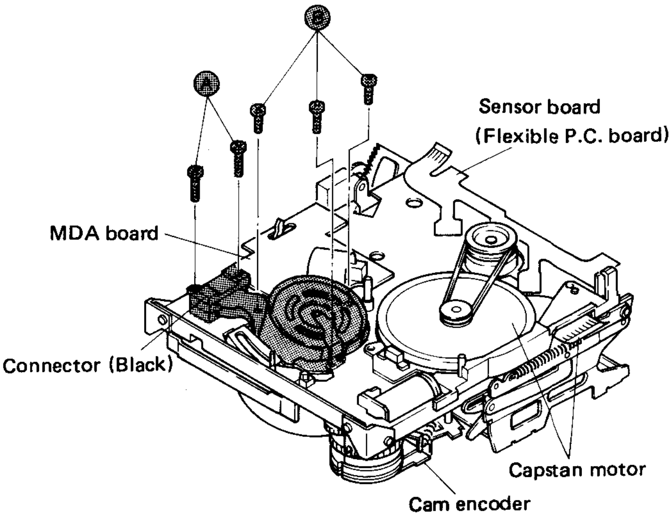

Ⓑ
Ⓐ
Sensor board (Flexible P.C. board)
MDA board
Connector (Black)
Capstan motor
Cam encoder

Fig. 1-6-10 Removing of drum assembly-1

1. Remove the screws Ⓐ and disconnect the FPC cable from the connector (black).
2. Remove the screws Ⓑ , then the drum assembly can be detached.

Note: The brush need not be removed.
Since the drum assembly is movable after the screws Ⓑ are removed, be the most careful not to damage it.

- Drum assembly detached from the deck section

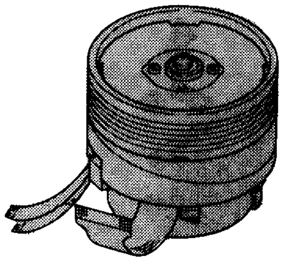


Fig. 1-6-11 Removeing of drum assembly-2

Note: After replacement of the drum assembly, make sure to perform the servo and interchangeability adjustments.
Refer to the description of "Deck-2 – Deck-5".

7. After replacement of the apper drum, perform the following adjustment precedences:
- Sec. 2.3 SERVO CIRCUIT & INTERCHANGEABILITY
- Sec. 2.5 2) PB Y level
  3) YNR input level
  4) PB RF equalizer
- Sec. 2.6 2) REC color level
  3) PB color level.

1.6.7 Check and adjustment of phase of mechanism

1. Loading rings

1) In the condition that the worm gear (inside the loading motor bracket ass'y) has been removed, turn the take-up and supply loading rings in the Unloading direction.

2) Assemble the take-up loading ring and supply loading ring so that the hole of the supply loading ring and the V-notch of the take-up loading ring are aligned with the triangle mark of the main deck being viewed from the top.

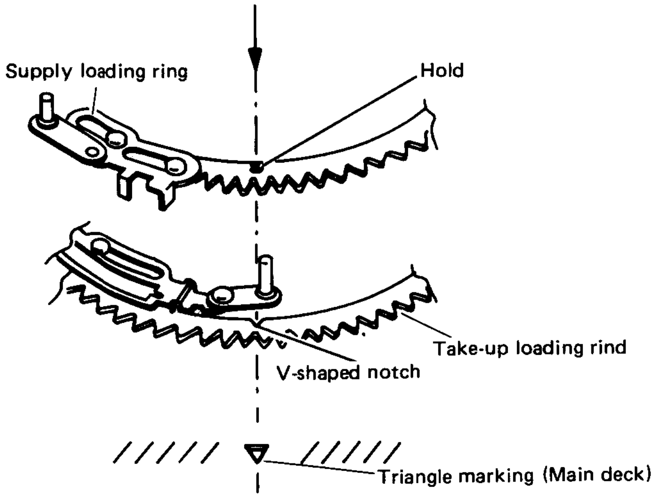

Supply loading ring
Hold
Take-up loading rind
V-shaped notch
Triangle marking (Main deck)

Fig. 1-6-12 Phase of loading ring-1

Note: Regarding correlative position of the pole base ass'y and ▲ mark of the guide rail

- Set the unit into the Stop mode, and move the supply guide roller and take-up guide roller close to each other by fingers (this applies to back-lash adjustment of the rings). At this time, confirm that an edge of the pole base (even if a little part) overlaps on ▲ mark.

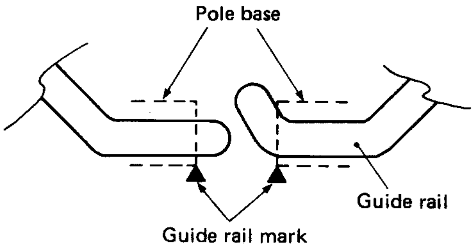

Pole base
Guide rail
Guide rail mark

Fig. 1-6-13 Phase of loading-2

2. Middle pole

1) Move the middle pole in the direction of the arrow Ⓐ.

2) Set the arm gear positioning its shaft Ⓓ aligns with the positioning hole Ⓒ and the middle pole's shaft Ⓔ in a line as shown in the figure.

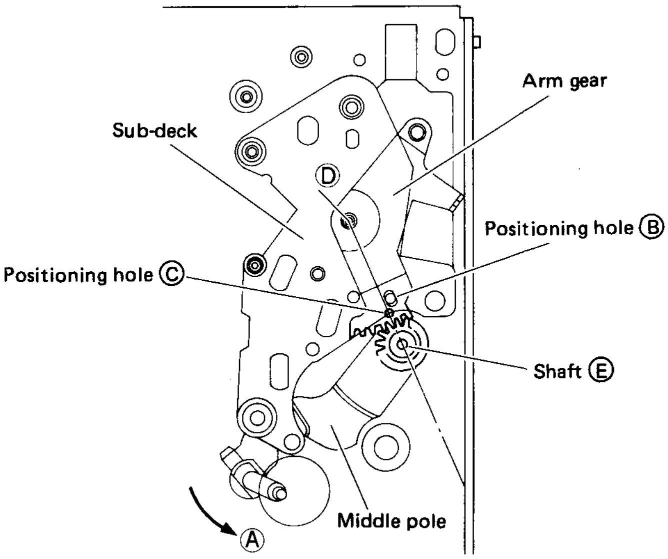

Sub-deck
Ⓓ
Arm gear
Positioning hole Ⓑ
Positioning hole Ⓒ
Shaft Ⓔ
Middle pole
Ⓐ

Fig. 1-6-14 Phase adjustment of middle pole

3. Control cam

Set the control cam (gear) as its marking is positioned in a straight line which connects the centers of its shaft and the terminal gear.

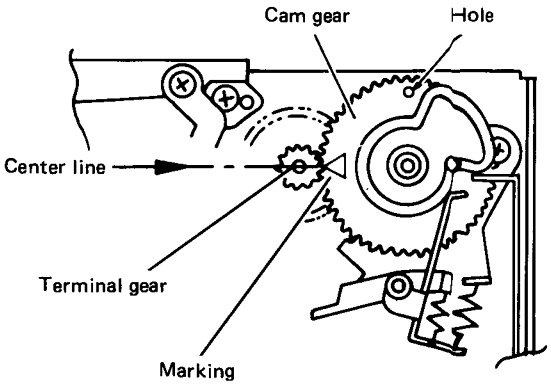

Cam gear
Hole
Center line
Terminal gear
Marking

Fig. 1-6-15 Phase adjustment of control cam

4. Mode control switch

Confirm that, in the Stop mode, the mode control switch has such the positional relation with others.

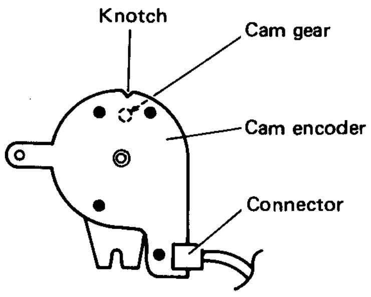

Knotch
Cam gear
Cam encoder
Connector

Fig. 1-6-16 Phase adjustment of mode control switch

1.7 INSPECTION AND MAINTENANCE

Since this model is equipped with rotary parts and consumptive parts which wear away as time passes, it is important to clean the tape transport system and rotary parts as well as to apply oil and grease to them in order to make full use of its real capacity for a long time.
Besides such the simple maintenance work, it needs to replace wearing parts periodically.

1.7.1 Standard servicing schedule for main components

The following table indicates the standard servicing period by kind of servicing such as cleaning, oiling, replacing, etc. In practice, the indicated periods will widely vary according to environmental and using conditions, but it is plain that nonfulfillment of the maintenance work not only shortens the specific period of every item sharply but also influences other components badly.
Also be aware that rubber parts may possibly deform and age as time passes even when the set is not used.

System	Symbol No.	Parts Name	Ass'y	Periodic servicing schedule (operation hours)								
				250	500	750	1000	1250	1500	1750	2000	3000
Tape Transport system	21	Impedance roller		★	★	★	★	★	★	★	★	★
	18	Supply slant pole	a									
	19	Supply guide roller	a									
	20	Tension pole	a									
	7	Middle pole	a									
	6	Take-up guide pole A	a									
	3	Take-up guide pole B	a									
	9	Take-up guide roller	a									
	10	Take-up slant pole	a									
	8	Capstan	a									
	2	Lower drum	a									
	1	Upper drum	a	★	★	☆	●	★	★	☆	●	●
	4	A/C head	a	★	★	★	★	★	★	★	★	●
	5	Pinch roller	a	★	★	★	★	★	★	★	★	●
Drive system	23	Capstan motor	a								●	
	22	Belt					○				●	○
	24	Mode control motor										●
	12	Take-up clutch gear	a	△	△	△	▲	△	△	△	▲	▲
	15	Supply reel disk	a	△	△	△	▲	△	△	△	▲	▲
	14	Center pulley	a				○				○	○
	13	Search brake lever		★	☆	★	☆	★	☆	★	☆	☆
	11	Take-up brake lever		★	★	★	☆	★	★	★	☆	☆
Others	16	Dumper					○				○	●
	17	Tension band	a				○				○	○
	25	Brush					○				○	○

★ : Cleaning
☆ : Cleaning (or Replacement if necessary)
△ : Lubrication
a : Will be provided as assembly parts for replacement

▲ : Lubrication (or Replacement if necessary)
● : Replacement
○ : Inspection or Replacement if necessary

Table 1-7-1 Maintenance schedule

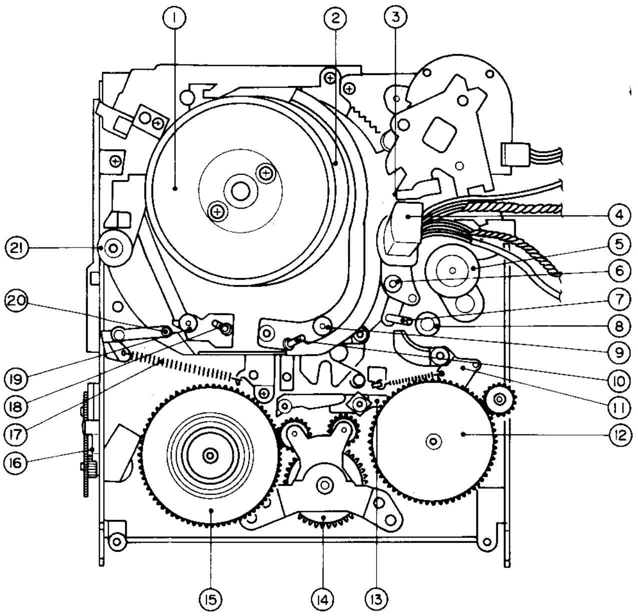


Fig. 1-7-1 Location of main mechanism parts (Top view)

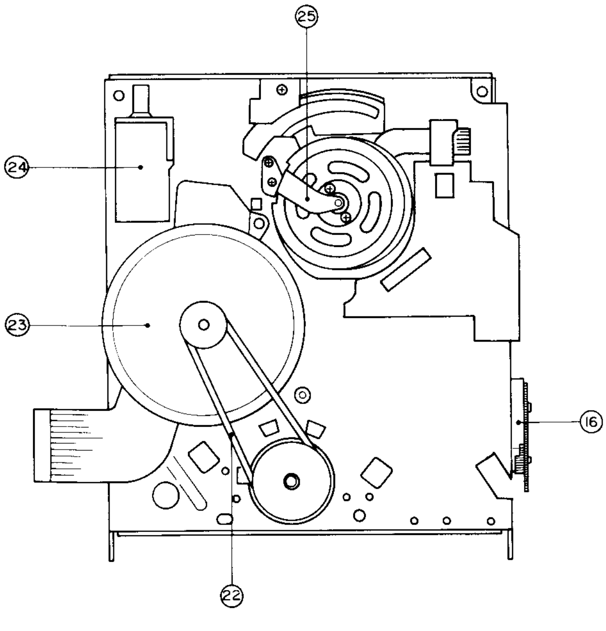


Fig. 1-7-2 Location of main mechanism parts (Bottom view)

1.7.2 Remarks

1. Cleaning

1) For cleaning of the upper drum (particularly video heads) use fine-woven cotton cloth or Kimwipe which alcohol soaks through. Regarding cleaning manner, do not move the cloth but turn the upper drum counterclockwise.
   Note: Make sure not to move the cloth in the vertical direction to the video head, since it causes damage of the video heads.
2) For cleaning of parts of the tape transport system except the upper drum, use fine-woven cotton cloth or cotton stick in which alcohol soaks.
3) For cleaning of the search brake lever and take-up brake lever, take off the take-up clutch gear first, and then clean them with cotton stick soaked with alcohol.
4) Before loading the deck with cassette tape, confirm that the cleaned parts are completely dry.

2. Applying oil and grease

1) For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly.
   Table 1-7-2 specifies oil and grease to be used.
2) When oiling, clean the objective parts first and then apply one or two drop(s) of oil. Too much oiling causes rotary parts to slip because of oil leakage.

Classification	Name	Parts No.	Symbol in drawing
Grease	Moriton Grease No.1	MOS2-C	A
Oil	Cosmo Hydro HV100	YTU94027	B

Table 1-7-2 Specific oil and grease to be used

3. Checkup

After replacement of the supply reel disk and tension band, make sure to inspect and adjust back tension according to the adjustment procedure of the deck section.

4. Replacement

For replacement parts which are supplied as assembly parts, they are indicated by "a" in the "Ass'y" column of the Table 1-7-1.

For their parts numbers, refer to the parts list of the mechanism assembly parts.

SECTION 2

DECK SECTION ADJUSTMENT

2.1 PREPARATION

2.1.1 Precautions

In most cases the deck section is in need of electrical adjustment, it results from replacement of worm mechanical parts or video heads.

In the event of malfunction with electrical circuits, troubleshooting with the aid of proper test instruments must be done first, and then commence necessary repair, replacement and adjustment, etc.

At field servicing without a complete range of test instruments, avoid unnecessary disturbance of the internal control settings. For satisfactory repair and adjustment, send back the unit to the factory or the nearest authorized service center.

If adjustment of the deck section is necessary, pay the most careful attention to the following.

1. When loading the deck with a VHS-C cassette, make sure to remove the cassette door since it contacts with the drum as it is.
2. In case of wiring to chip test points for measurement and observation, use IC clips to avoid any stress.
3. For adjustment of the Y/C circuits equipped with trimming resistors, replace them with specified V. resistors beforehand.

2.1.2 Standard connections

For electrical adjustment of the deck section, disassemble the deck section from the main body referring to section 1 "Service Caution and Disassembly", and connect it and test instruments as shown in Fig. 2-1-1.

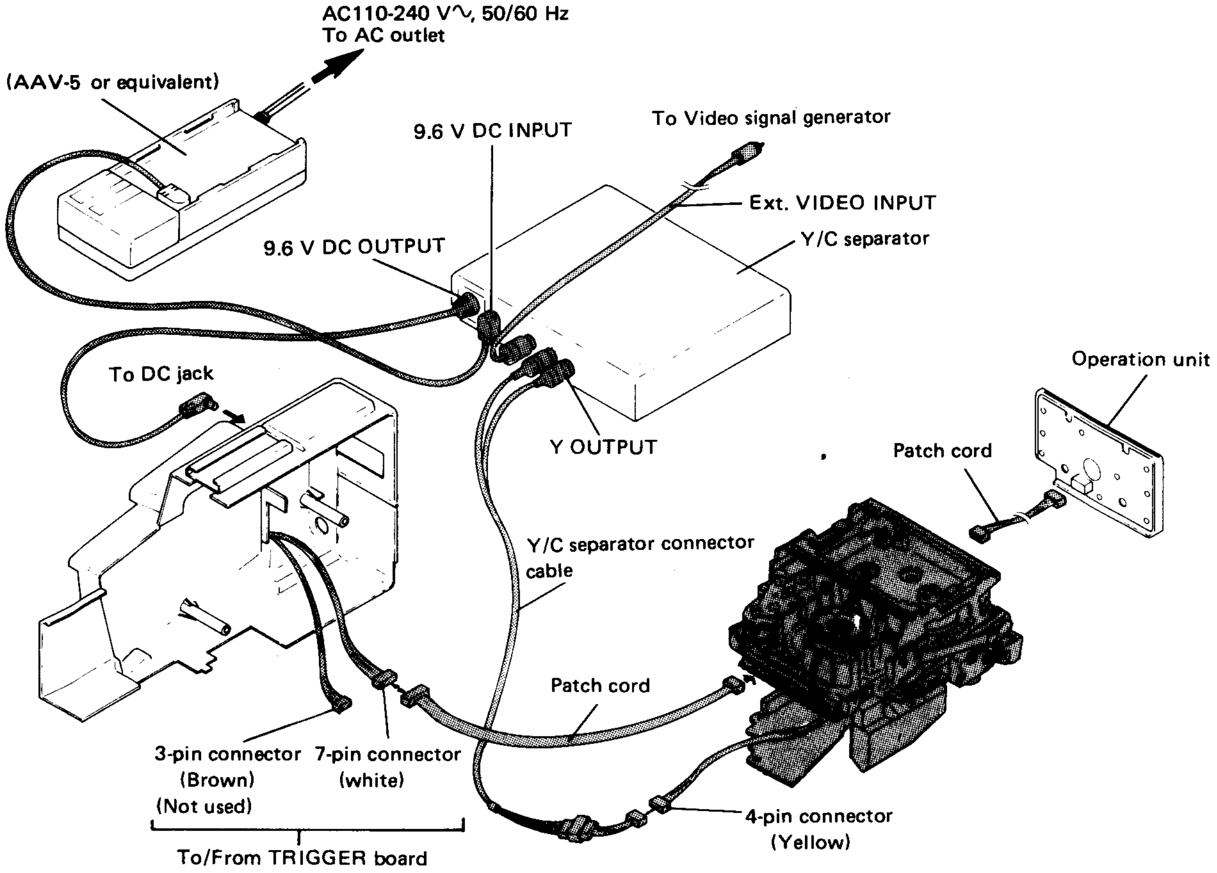

AC110-240 V∿, 50/60 Hz
To AC outlet
(AAV-5 or equivalent)
9.6 V DC INPUT
To Video signal generator
Ext. VIDEO INPUT
Y/C separator
9.6 V DC OUTPUT
To DC jack
Operation unit
Y OUTPUT
Patch cord
Y/C separator connector cable
Patch cord
3-pin connector (Brown) (Not used)
7-pin connector (white)
4-pin connector (Yellow)
To/From TRIGGER board

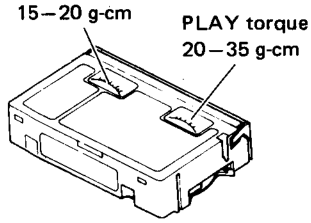
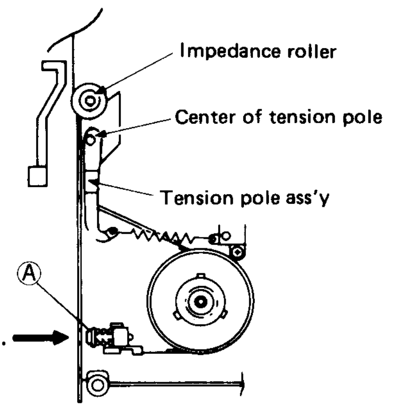
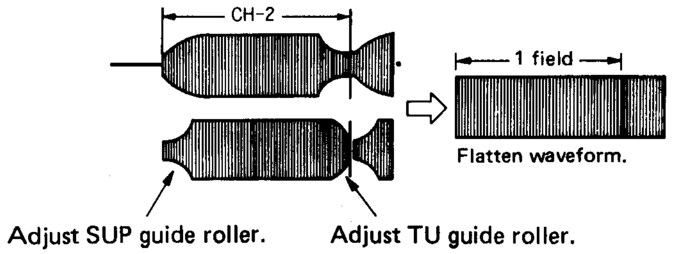
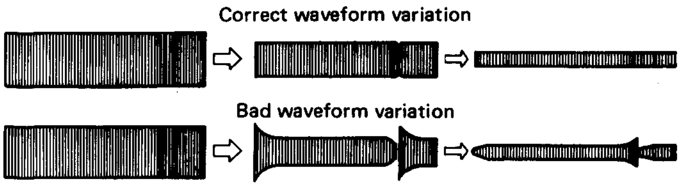
Fig. 2-1-1 Standard setup for deck section adjustment

2.2 REGULATOR CIRCUIT ([0][1] MAIN-2 board)

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	REG 8 V	• SP REC	• TP3 (REG 8 V OUT) [0][1] MAIN	• R4 (REG 8 V) [0][1] MAIN	1) Connect a DC voltmeter between TP3 and TP5 (GND), and adjust R4 so that the voltmeter reads 8 ± 0.1 V DC.

2.3 SERVO CIRCUIT & INTERCHANGEABILITY

- Perform this adjustment after replacement of the drum ass'y or upper drum ass'y.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Back tension  **Fig. 2-3-1** Cassette torque meter  Impedance roller Center of tension pole Tension pole ass'y Ⓐ Adjust this. **Fig. 2-3-2** Correlative positions of tension pole and impedance roller	• Cassette torque meter • REC	• Cassette torque meter	• Screw Ⓐ	1) Set a cassette torque meter into the deck in the mode of REC, and adjust the screw Ⓐ so that back tension becomes 15–20 g-cm. At the same time, confirm that play torque is 20–35 g-cm. 2) Set the beginning portion of a EC-30 cassette tape to REC mode. Confirm the tension pole and the impedance roller shaft are in a straight line to the front of the deck. **Notes:** • Confirm that the tension pole does not contact with the chassis at the beginning of the tape and the impedance roller rotates at tne end of the tape. • If results of the adjustment in the steps 1) and/or 2) are unsatisfactory, replace the tension band. If there is big changes in the values measured by the cassette torque meter, replace the supply reel disk.
2	Tape pattern  CH-2 1 field Flatten waveform. Adjust SUP guide roller. Adjust TU guide roller. **Fig. 2-3-3** FM waveform  **Fig. 2-3-4** FM waveform	• MH-C2 Stairstep	• TP109 (PB FM OUT) • TP111 (DRUM FF) (Ext. trigger) [0][1] MAIN	• SUP & TU guide rollers	1) Observe waveform at TP109 with external trigger (+) of TP111. 2) Play the MH-C2 tape and maximize the FM waveform by the TRACKING control. 3) If the FM waveform is not flat, adjust the supply and take-up guide rollers with a 1.5 mm hex. wrench. **Note:** To prevent the tape from damage, turn the guide rollers slowly. 4) By turning the TRACKING control, vary the FM waveform output from maximum to minimum (and vice versa) gradually, and confirm that the variation proceeds in a flat shape. (Fig. 2-3-4). 5) If the FM waveform breaks in the varying process, adjust height of guide roller(s) subtly every breaking so that variation proceeds as flat as possible. Repeat the steps 4) and 5) to find a shape of flat variation.

No.	Item	Mode & Signal	Test Point Waveform & Adjustment	Adjustment Parts	Procedure
		• REC then PB			6) After the above steps, set the mode to STOP once and then to PB again for final checkup since the positions of the guide rollers change in the course of adjustment. 7) Record the signal and play it back to confirm that there is nothing abnormal. 8) Through the above steps, confirm that there occur no wrinkling and damage in the tape around the impedance roller and TU side guide pole whenever the deck is in operation of Loading/Unloading, Search Rewind, and at mode change from Search Rewind to Play mode. If wrinkling or damage in the tape occurs around the TU guide pole, adjust the angle (slant) of the A/C head to the tape so that the tape normally runs along the lower flange of the guide pole.

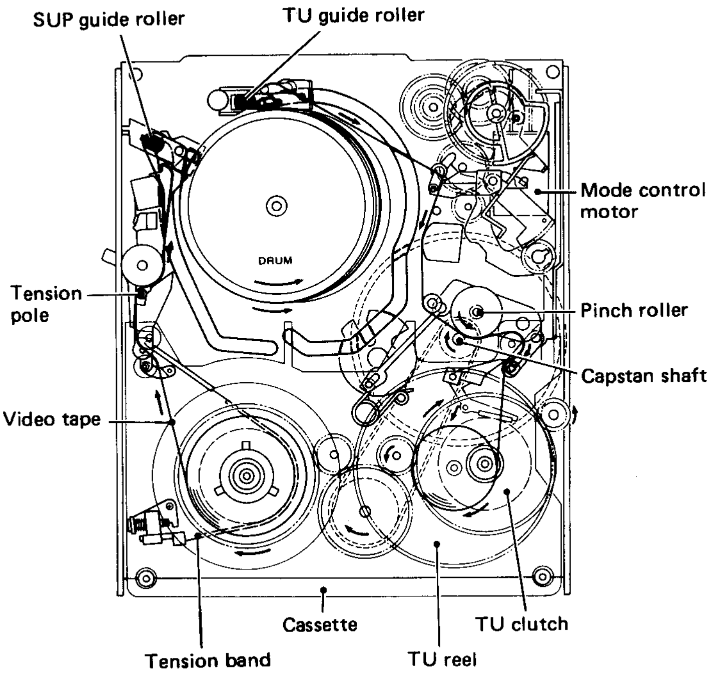

SUP guide roller
TU guide roller
Mode control motor
DRUM
Tension pole
Pinch roller
Capstan shaft
Video tape
Cassette
TU clutch
Tension band
TU reel

Fig. 2-3-5 Tape transport system

No.	Item	Mode & Signal	Test Point Waveform & Adjustment	Adjustment Parts	Procedure
3	A/CTL head height & azimuth	• MH-C2 Audio 6 kHz (stairstep)	• LINE OUT (A/V cable OUT) $\boxed{0}$ $\boxed{1}$ MAIN	• A/C head	1) Play the stairstep signal (audio 6 kHz) of MH-C2 tape and observe the waveform at LINE OUT terminal. **Note:** If the output level is about −6 dBs (1.1 Vp-p), it is normal. 2) If necessary, slightly and evenly turn the screws Ⓐ (reference), Ⓑ (slant to the front) and Ⓒ (azimuth) in the same direction .(up to 45° each) to obtain the maximum output level. 3) For fine adjustment, use the screw Ⓑ to decrease the waveform fluctuation in level while use the screw Ⓒ to obtain the maximum output level.

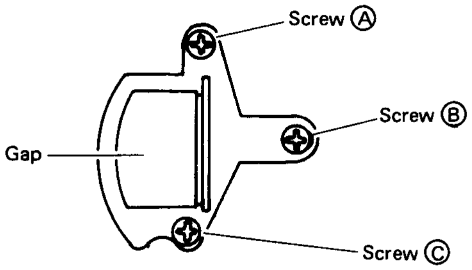

Screw Ⓐ
Screw Ⓑ
Gap
Screw Ⓒ

Fig. 2-3-6 A/C head

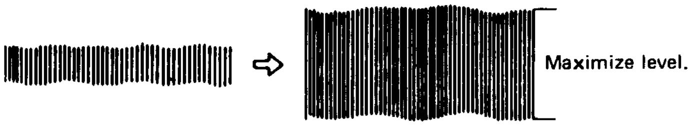
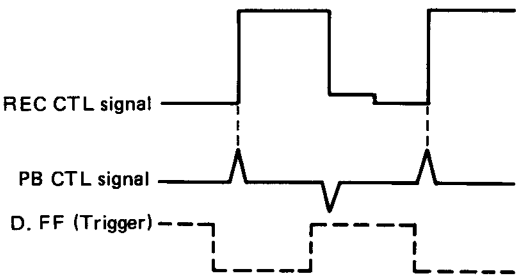
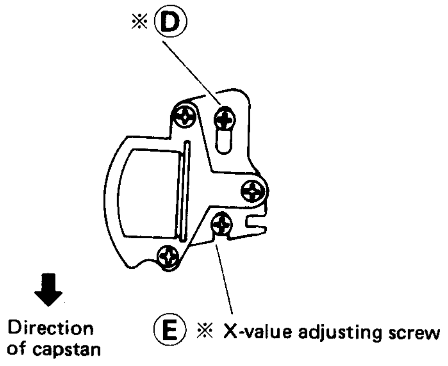
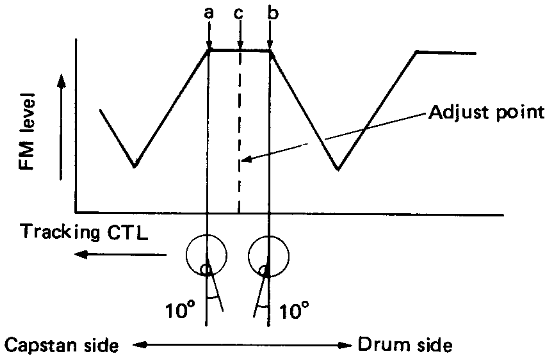
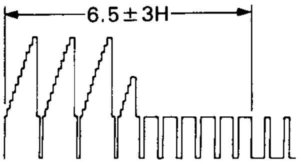


Fig. 2-3-7 Audio signal

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
4	Tracking preset	• REC & PB • TRACKING control: Center	• TP108 (PB CTL PULSE OUT) • TP111 (DRUM FF) (Ext. trigger) 0 1 MAIN  Fig. 2-3-10 Tracking preset	• R103 (TRACKING PRESET) 0 1 MAIN	1) Set the mode to REC. 2) Observe waveform at TP108 with extenal trigger (–) of TP111. 3) Take note of the rise point of TP108 waveform. 4) Set the TRACKING control to the center position. 5) Play back the recorded section and adjust R103 so that the positive pulse of TP108 waveform coincides with the rise point in the recording.
5	CTL head phase (X value)	• MH-C2 Stairstep • TRACKING control: Center	• TP109 (PB FM OUT) • TP111 (DRUM FF) (Ext. trigger) 0 1 MAIN  Fig. 2-3-8 CTL head phase  Fig. 2-3-9 Adjusting point of CTL head phase	• CTL head	1) Observe waveform at TP109 with external trigger (+) of TP111. 2) Play MH-C2 tape. 3) While turning the Tracking CTL, confirm the following matter. When the Tracking CTL is set to the center click position, FM level should be maximum. When turning it to the left or right within about 10°, FM level maintain maximum, and when turning more than 10°, FM level starts to fall. 4) If item 3) is not satisfied, the adjustment must be performed. Slightly loosen screws Ⓓ and Ⓔ and put the A/C head fully in the direction of the capstan, and then, gradually move the A/C head to the direction of the drum side and find out the point "c" to get the correct control head phase. 5) Fasten screws Ⓓ and Ⓔ. Confirm step 3). 6) If possible, perform recording. Play that tape in the deck VCR and make sure that interchangeability is normal.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
6	PB switching point	• MH-C2 Stairstep • TRACKING control: Center	• CN6 pin 3 (VIDEO OUT) $\boxed{0}\boxed{2}$ Y/C • TP111 (DRUM FF) (Ext. trigger) $\boxed{0}\boxed{1}$ MAIN  **Fig. 2-3-11** PB switching point	• R108 (PB SW POINT) $\boxed{0}\boxed{1}$ MAIN	1) Observe waveform at pin 3 of CN6 with external trigger pulse (–) of TP111. 2) Adjust R108 so that trigger point is observed 6.5 H before the rise of V. sync. signal.

2.4 PRE-AMP CIRCUIT

Note: Make this adjustment only when inversion and flicker are extreme while playing back the MH-C2 color bars after replacing the upper drum.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Video Head Resonance /Fo	• MH-C2 RF sweep	•TP7 (PB FM OUT) $\boxed{0}\boxed{2}$ Y/C	•Separate chart	1) Play RF sweep portion of MH-C2. 2) Connect the oscilloscope to TP7 on the Y/C board and a trigger. **Note:** Waveforms can be obtained from all channels by applying the triggers shown in the chart to the left. 3) Rotate the tracking knob and set the FM output to maximum. 4) Confirm tha the waveforms of all channels are as shown in Figure 2-4-1. 5) If the 4–5 MHz marker FM output level shown in Figure 2-4-2 is low, adjust the R of that channel and set the level to maximum. 6) Measure the 2 MHz and 5 MHz retios (a/b) of all channels. Select the channel with the best value and adjust the R of all other channels to this same value. 7) Next, when there is no peak during A, adjust the C of that channel so that there is a peak during A. 8) After adjustment, confirm that there is no inversion or flicker during MH-C2 color bar playback and self-recording and playback.

	Trigger (–)	Adjustment (R)	Adjustment (C)
CH-1	CN5, pin 11	VR2 (Q 1 ch)	VC2 (f_0 1 ch)
CH-2	CN5, pin 13	VR4 (Q 2 ch)	VC4 (f_0 2 ch)
CH-3	CN5, pin 10	VR1 (Q 3 ch)	VC1 (f_0 3 ch)
CH-4	CN5, pin 12	VR3 (Q 4 ch)	VC3 (f_0 4 ch)

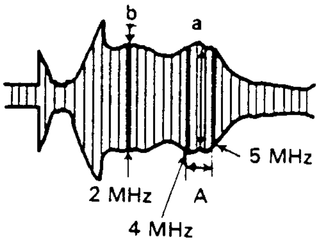


Fig. 2-4-1 PB FM

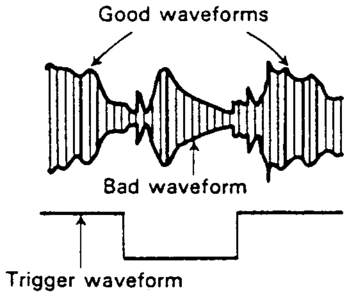
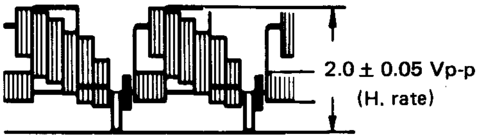
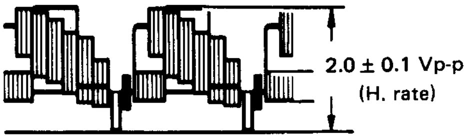
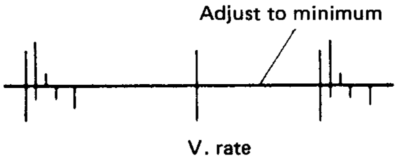
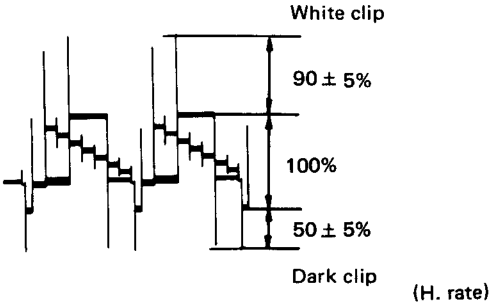
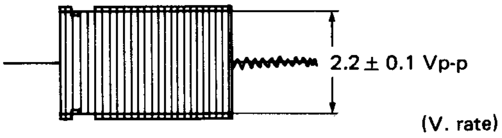
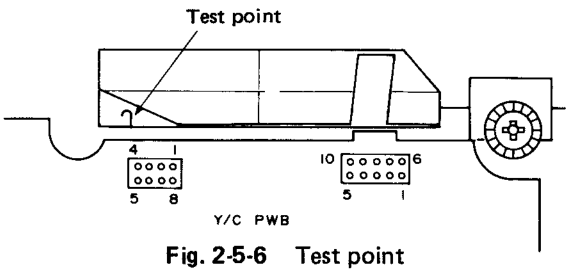
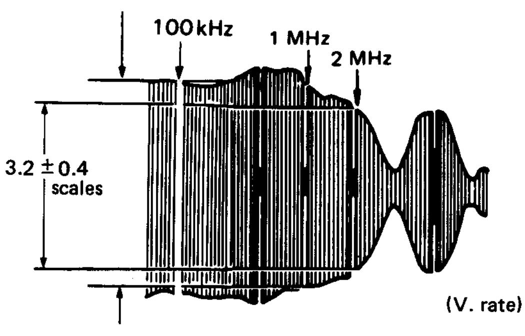


Fig. 2-4-2 PB FM (Trigger waveform)

2.5 Y SIGNAL CIRCUIT

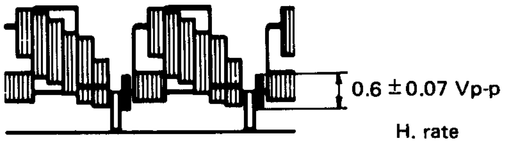
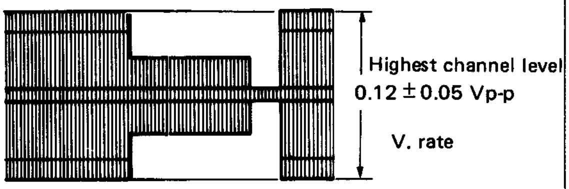
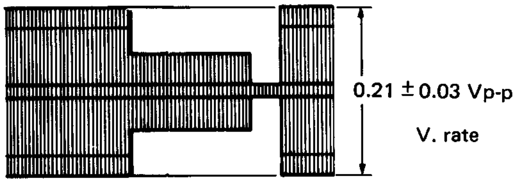
Note: Before proceeding to do the following adjustment, make sure of the normal value or setting of the item.
Unless otherwise indicated, all test points and adjustment parts are located on [0] [2] Y/C board.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	E-E Y level	• Color bar • E-E	• CN6 pin 3 (VIDEO OUT) [0] [2] Y/C  Fig. 2-5-1 E-E Y level	• R150 (E-E Y LEVEL) [0] [2] Y/C	1) Connect the oscilloscope to pin 3 of CN6. 2) Adjust R150 so that signal level becomes 2.0 Vp-p.
2	PB Y level	• MH-C2 Color bar	• CN6 pin 3 (VIDEO OUT) [0] [2] Y/C  Fig. 2-5-2 PB Y level	• R156 (PB Y LEVEL) [0] [2] Y/C	1) Connect the oscilloscope to pin 3 of CN6. 2) Adjust R156 so that signal level becomes 2.0 Vp-p.
3	Y NR input level	• MH-C2 (Color bar)	• TP2 (DEMOD OUT) • TP3 (1H DL DEMOD OUT) • TP10 (DRUM FF IN) for trigger [0] [2] Y/C  Fig. 2-5-3 Y NR edge noise	• R157 (PB 1H DEMOD LEVEL) [0] [2] Y/C	1) Play MH-C2 color bar portion. 2) Connect one channel of dual trace oscilloscope to TP2 and the other channel to TP3. Change CH-2 to reverse (INV) mode and align both channels' VOLTs/DIV. SW to the same range and select Vertical mode SW to ADD. 3) Adjust R157 for minimum level in order to adjust to the same level.
4	White & Dark clip	• Color bar • REC	• TP4 (MAIN EMPHASIS OUT) [0] [2] Y/C  White clip 90 ± 5% 100% 50 ± 5% Dark clip (H. rate) Fig. 2-5-4 White/dark clip	• R154 (WHITE CLIP LEVEL) • R155 (DARK CLIP LEVEL) [0] [2] Y/C	1) With the oscilloscope connected to TP4, adjust R154 and R155 so that white clip becomes 90 ± 5% and dark clip becomes 50 ± 5%, respectively.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
5	Carrier deviation	• REC • No input	• TP1 (MOD OUT)	• R153 (CARRIER)	**Note:** This adjustment should be performed only when E-E and playback of pre-recorded tape are normal, while the sync at self-recording is distorted (poor carrier set) or S/N is extremely poor (poor deviation). 1) Connect the frequency counter to TP1 and adjust R153 for 3.8 MHz ± 100 kHz without input signal.
		• REC & PB • Grey scale	• CN6 pin 3 (VIDEO OUT) $\boxed{0}$ $\boxed{2}$ Y/C	• R152 (DEVIATION) $\boxed{0}$ $\boxed{2}$ Y/C	2) Pick up the grey scale to record it and play it back to confirm that Y level at pin 3 of CN6 is 2.0 ± 0.2 Vp-p. If necessary, adjust R152 during recording and repeat the above step for confirmation.
6	REC FM level	• Color bar • REC	• Pre-amp's test pin (CH-A REC FM OUT) $\boxed{0}$ $\boxed{4}$ PRE-AMP • TP10 (DRUM FF IN) (Ext. trigger) $\boxed{0}$ $\boxed{2}$ Y/C	• R158 (REC FM LEVEL) $\boxed{0}$ $\boxed{2}$ Y/C	1) Observe waveform at the HEAD terminal with external trigger pulse (–) of TP10. 2) Adjust R158 to obtain 2.2 Vp-p as the FM level in the pedestal section.
		 Fig. 2-5-5 REC FM level  Test point 4 1 5 8 10 6 5 1 Y/C PWB Fig. 2-5-6 Test point			
7	Video EQ	• Color sweep • REC & PB	• CN6 pin 3 (VIDEO OUT) $\boxed{0}$ $\boxed{2}$ Y/C	• R159 (PB RF EQ) $\boxed{0}$ $\boxed{2}$ Y/C	1) Record the sweep signal (0 to 4 MHz). 2) Connect the oscilloscope's probe to pin 3 of CN6, and play back the recorded sweep signal. 3) In the case the sweeper's 100 kHz marker frequency (start) is for 4 scale divisions on the oscilloscope screen, adjust R159 so that 2 MHz marker level becomes 3.2 scale divisions.
		 4 scale divisions 100kHz 1 MHz 2 MHz 3.2 ±0.4 scales (V. rate) Fig. 2-5-7 PB RF equalizer			

2.5.1 Color circuit

Note: Before proceeding to do the following adjustment, make sure of the normal value or setting of the item.
Unless otherwise indicated, all test points and adjustment parts are located on $\boxed{0}\boxed{2}$ Y/C board.

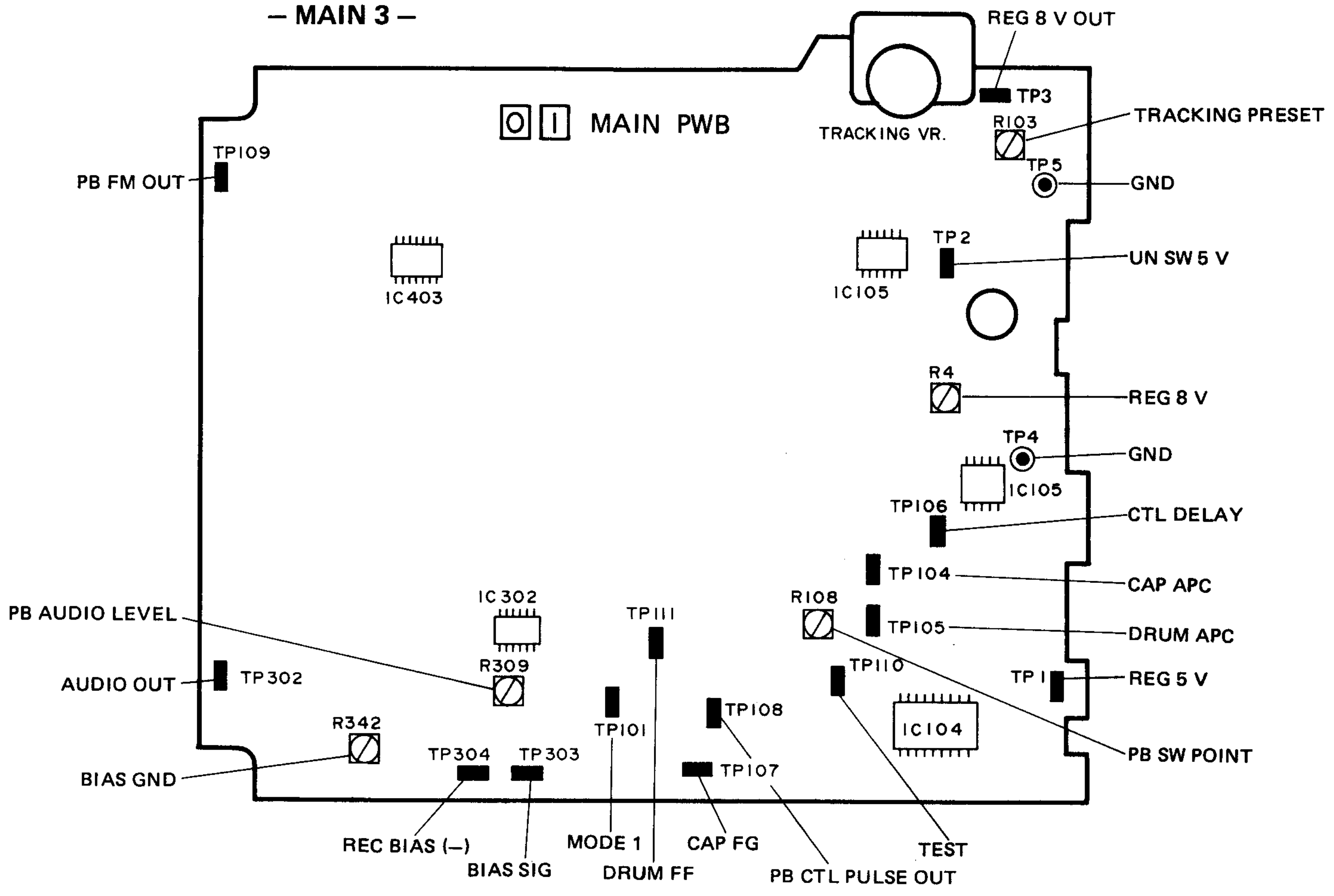
No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	E-E burst level	• E-E • Color bar	• CN6 pin 3 (VIDEO OUT) $\boxed{0}\boxed{2}$ Y/C	• R151 (BURST LEVEL) $\boxed{0}\boxed{2}$ Y/C	1) Connect the oscilloscope to pin 3 of CN6. 2) Adjust R151 so that burst level becomes 0.6 ± 0.07 Vp-p.
2	PB burst level	• REC & PB • Color bar	• CN6 pin 3 (VIDEO OUT) $\boxed{0}\boxed{2}$ Y/C	• R160 (PB BURST LEVEL) $\boxed{0}\boxed{2}$ Y/C	1) Record the color bar signal and play it back. Adjust R160 to obtain 0.6 Vp-p at pin 3 of CN6 as the burst level.
			 Fig. 2-5-8 PB burst level		
			• TP6 (PB ACC IN) $\boxed{0}\boxed{2}$ Y/C		
3	PB ACC input level	• MH-C2 • Color bar	• CN5 pin 1 (SW A) (Ext. trigger) $\boxed{0}\boxed{1}$ MAIN	• R162 (PB ACC INPUT LEVEL) $\boxed{0}\boxed{2}$ Y/C	1) Observe waveform at TP6 with external trigger pulse of pin 1 (SW A) of CN5 of the MAIN board. 2) Adjust R162 so that of the highest channel level becomes 0.12 Vp-p.
			 Fig. 2-5-9 PB ACC input level		
4	REC color level	• MH-C2 Color bar	• TP6 (PB ACC IN) $\boxed{0}\boxed{2}$ Y/C • CN5 pin 1 (SW A) (Ext. trigger) $\boxed{0}\boxed{1}$ MAIN	• R161 (REC COLOR LEVEL) $\boxed{0}\boxed{2}$ Y/C	1) Connect the oscilloscope to TP6 and pin 1 (for external trigger) of CN5 on the MAIN board. 2) Play MH-C2 color bar portion. 3) Turn the Tracking CTL for maximum color level at TP6 and make a note of the highest channel level "A".
			 Fig. 2-5-10 REC color level		
		• REC then PB • Color bar			4) Record the color bar and then play the same portion. 5) Confirm that the highest channel level becomes 100% ± 10% of the noted level. 6) If necessary, adjust R161 during recording. 7) Confirm that the level difference between 4 channels is within 4 dB.

2.6 AUDIO CIRCUIT

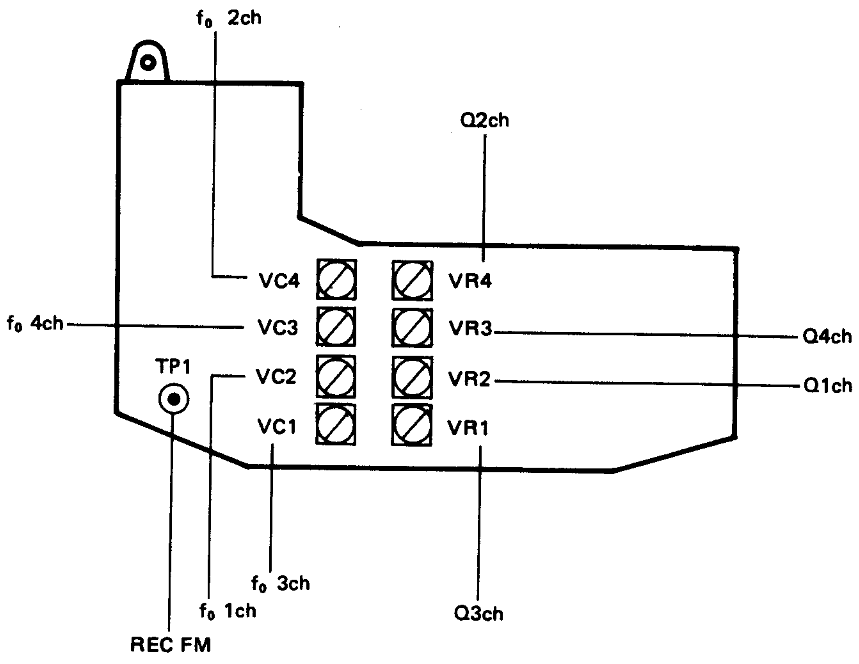
No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Bias level	• No input signal • REC mode	• TP303 (REC BIAS +) • TP304 (REC BIAS –) $\boxed{0}\boxed{1}$ MAIN	• R342 (BIAS LEVEL) $\boxed{0}\boxed{1}$ MAIN	1) Connect an audio tester between TP303 and TP304, and adjust R342 so that the level is 2.2 mVrms in the Normal mode. 2) Confirm that the level is 3.0 mVrms in the S-VHS mode.
2	PB audio level	• MH-C1 • Color bars (1 kHz)	• AUDIO OUT	• R309 (PB AUDIO LEVEL) $\boxed{0}\boxed{1}$ MAIN	1) Connect the audio tester to the AUDIO OUT terminal, and adjust R309 to obtain –6 dBs as PB audio signal level.

• LOCATION OF TEST POINTS AND VRs ON THE MAIN AND Y/C BOARDS

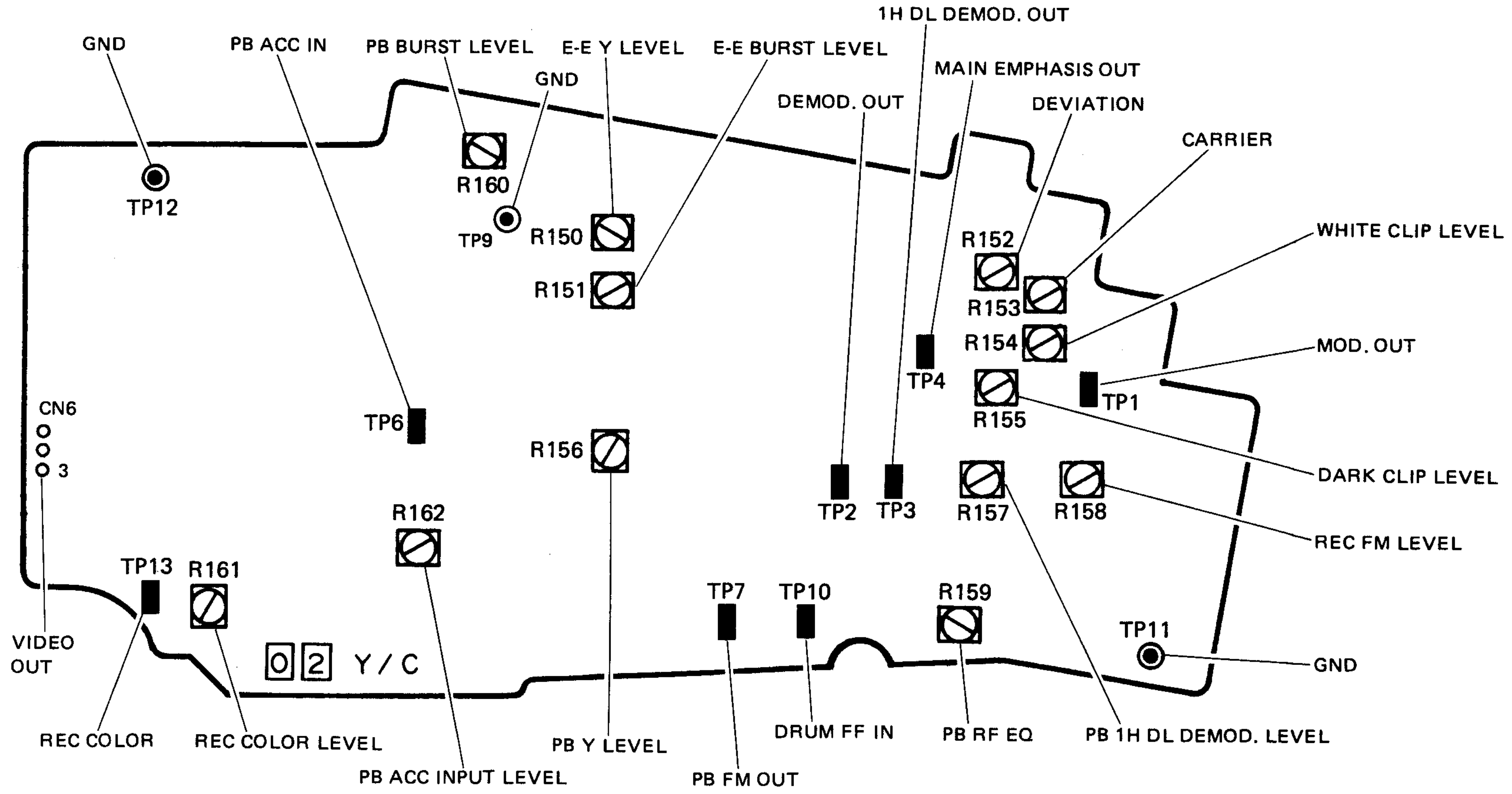
– MAIN 3 –


01 MAIN PWB
REG 8 V OUT
TP3
TRACKING VR.
R103
TRACKING PRESET
TP5
GND
TP109
PB FM OUT
IC403
IC105
TP2
UN SW 5 V
R4
REG 8 V
TP4
GND
IC105
TP106
CTL DELAY
TP104
CAP APC
TP105
DRUM APC
R108
TP110
TP1
REG 5 V
IC104
PB SW POINT
IC302
R309
PB AUDIO LEVEL
TP111
TP302
AUDIO OUT
R342
BIAS GND
TP101
TP108
TP107
TP304
TP303
REC BIAS (–)
BIAS SIG
MODE 1
DRUM FF
CAP FG
PB CTL PULSE OUT
TEST

– PRE AMP –


f₀ 2ch
Q2ch
VC4
VR4
f₀ 4ch
VC3
VR3
Q4ch
TP1
VC2
VR2
Q1ch
VC1
VR1
f₀ 3ch
f₀ 1ch
Q3ch
REC FM

– Y/C –

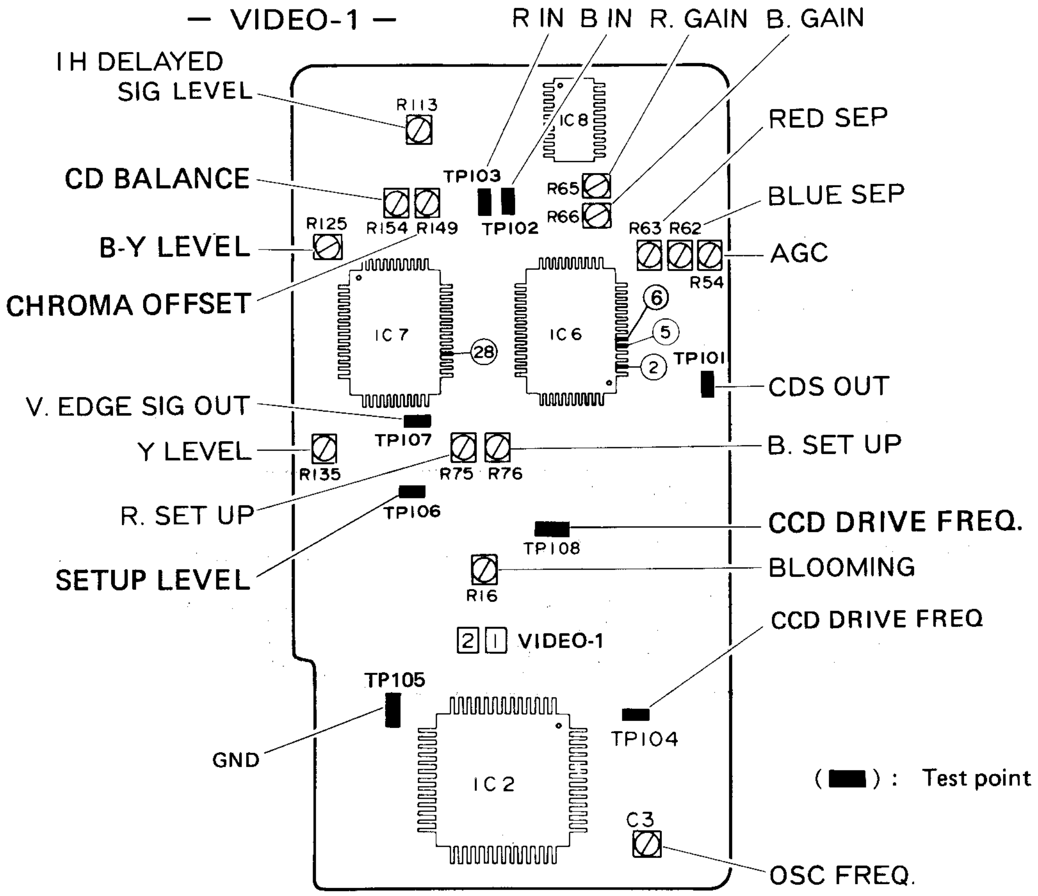

GND
TP12
PB ACC IN
PB BURST LEVEL
R160
GND
TP9
E-E Y LEVEL
R150
E-E BURST LEVEL
R151
1H DL DEMOD. OUT
MAIN EMPHASIS OUT
DEMOD. OUT
DEVIATION
CARRIER
R152
R153
WHITE CLIP LEVEL
R154
TP4
MOD. OUT
TP1
R155
DARK CLIP LEVEL
CN6
3
TP6
R156
TP2
TP3
R157
R158
REC FM LEVEL
R162
TP13
R161
VIDEO OUT
02 Y/C
TP7
TP10
R159
TP11
GND
REC COLOR
REC COLOR LEVEL
PB ACC INPUT LEVEL
PB Y LEVEL
PB FM OUT
DRUM FF IN
PB RF EQ
PB 1H DL DEMOD. LEVEL

▬ ◉ : Test point for easy hookup with oscilloscope probe

▨ : Adjusting VR

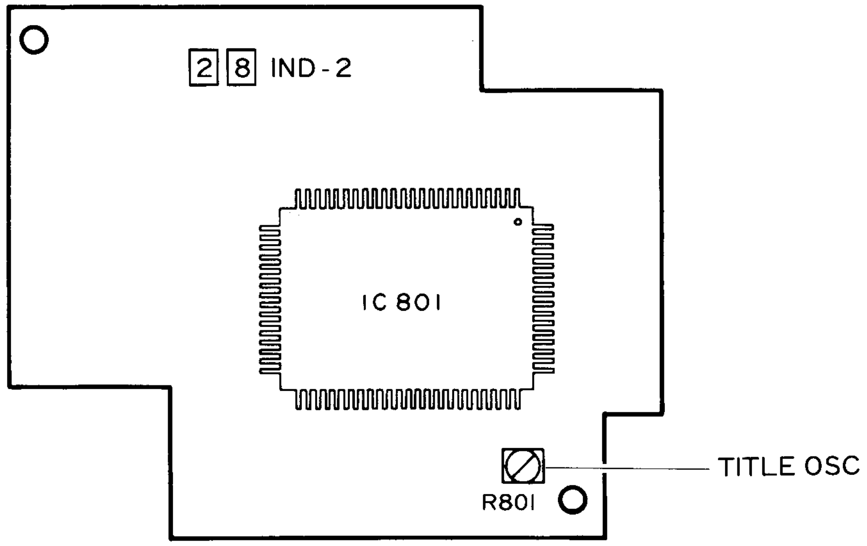
- LOCATION OF TEST POINTS AND VRs ON THE CAMERA SECTION'S BOARDS

— VIDEO-1 —

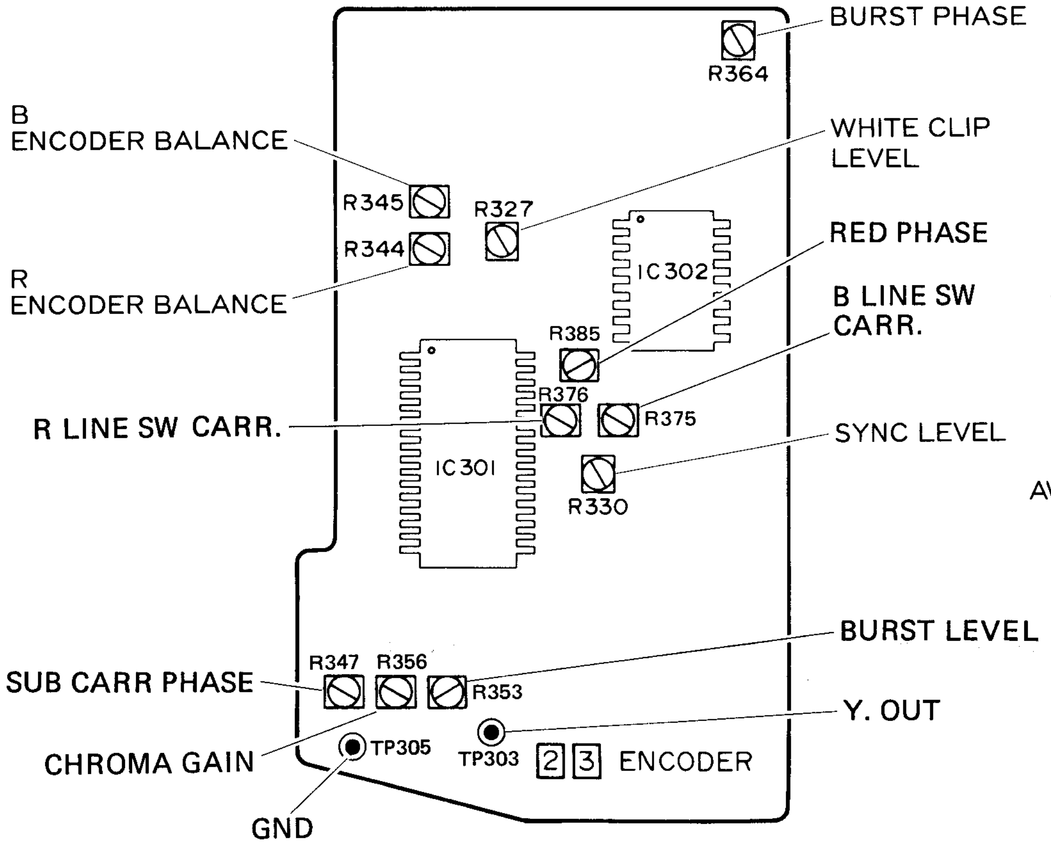

R IN
B IN
R. GAIN
B. GAIN
I H DELAYED SIG LEVEL
R113
IC8
CD BALANCE
TP103
R65
R66
RED SEP
BLUE SEP
R125
R154
R149
TP102
R63
R62
B-Y LEVEL
AGC
R54
CHROMA OFFSET
IC7
㉘
IC6
⑥
⑤
②
TP101
CDS OUT
V. EDGE SIG OUT
TP107
Y LEVEL
R135
R75
R76
B. SET UP
R. SET UP
TP106
SETUP LEVEL
TP108
CCD DRIVE FREQ.
BLOOMING
R16
2 1 VIDEO-1
CCD DRIVE FREQ
TP105
TP104
GND
IC2
C3
OSC FREQ.

(▬) : Test point for easy hookup with oscilloscope probe

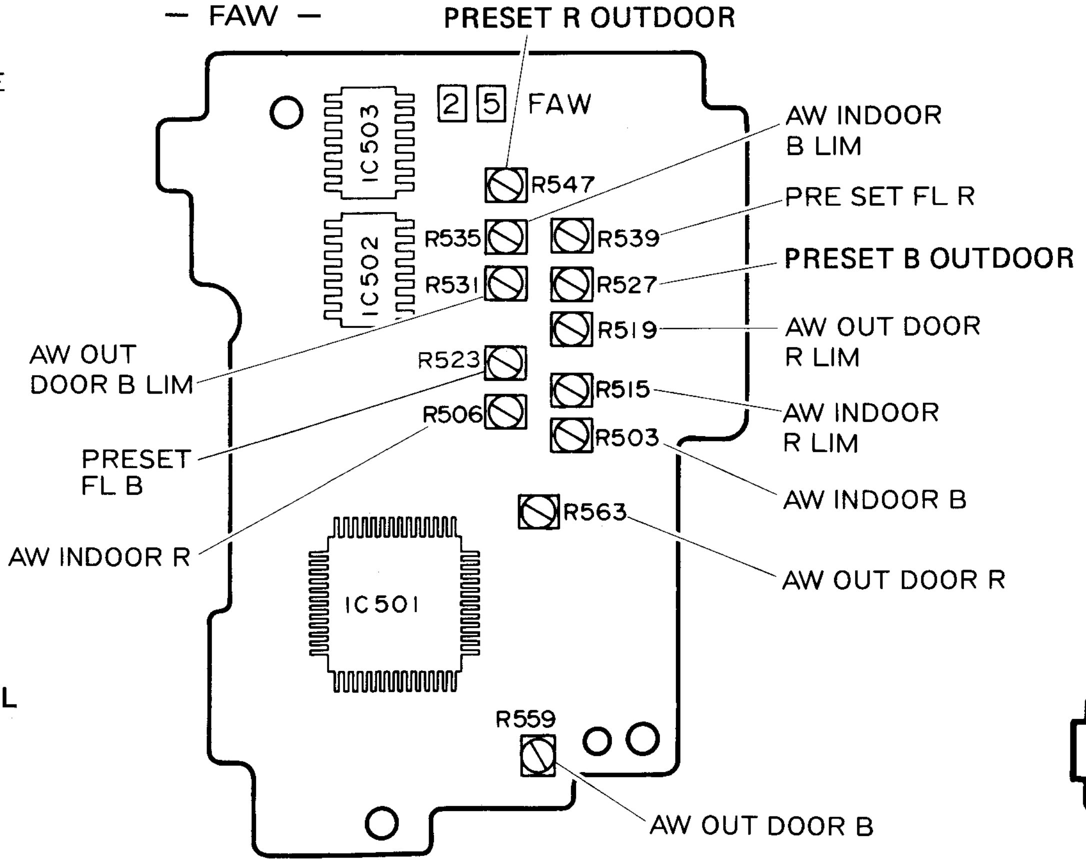
— IND-2 —


2 8 IND-2
IC 801
TITLE OSC
R801

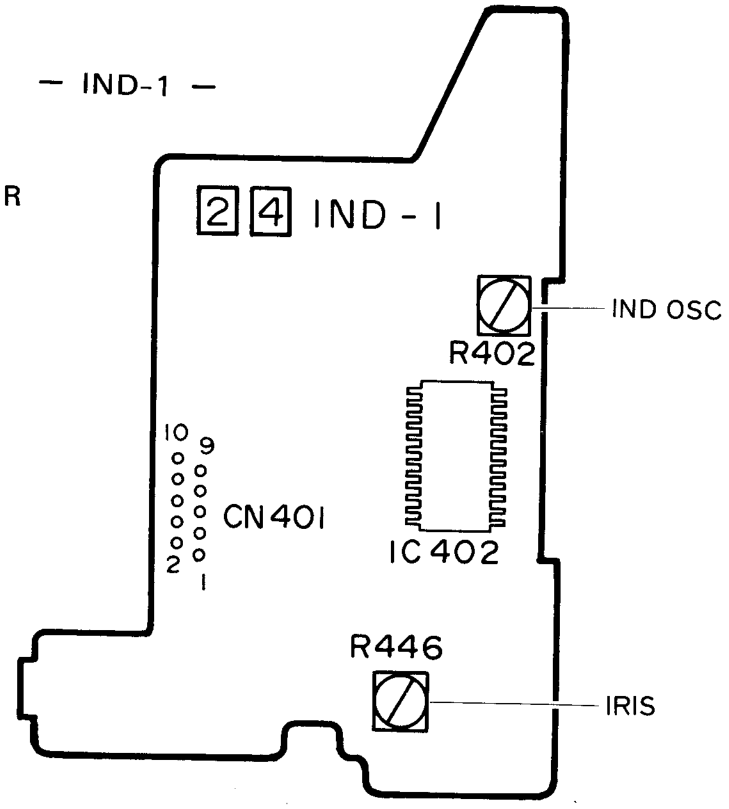
— ENCODER —


BURST PHASE
R364
B ENCODER BALANCE
WHITE CLIP LEVEL
R345
R327
R344
IC302
RED PHASE
R ENCODER BALANCE
B LINE SW CARR.
R385
R376
R375
R LINE SW CARR.
SYNC LEVEL
IC301
R330
BURST LEVEL
R347
R356
SUB CARR PHASE
R353
Y. OUT
CHROMA GAIN
TP305
TP303
2 3 ENCODER
GND

— FAW —


PRESET R OUTDOOR
IC503
2 5 FAW
AW INDOOR B LIM
R547
IC502
R535
R539
PRE SET FL R
R531
R527
PRESET B OUTDOOR
R519
AW OUT DOOR R LIM
AW OUT DOOR B LIM
R523
R515
PRESET FL B
R506
AW INDOOR R LIM
R503
AW INDOOR B
AW INDOOR R
R563
AW OUT DOOR R
IC501
R559
AW OUT DOOR B

— IND-1 —


2 4 IND - I
IND OSC
R402
10
9
2
1
CN401
IC402
R446
IRIS

SECTION 3
CAMERA SECTION ADJUSTMENT

3.1 PREPARATION

3.1.1 Precautions

1. Make sure to use 2 or more lighting fixtures (3200 K in color temperature) and to light up the test pattern with them at 1200 lux or more brightly.
2. Use clean test pattern and camera filters.
3. All adjustments must be performed in a room that shuts out other light than the specific illumination.
4. Unless otherwise specified, proceed to adjust the camera section as the controls set to the following positions.

FOCUS	:	MANUAL
WHITE BALANCE	:	PRESET INDOOR
SHUTTER SPEED	:	STANDARD (STD)

3.1.2 Connections for adjustment

- For disassembly of the camera section, refer to section 1 " Service Caution and Disassembly", and connect it and test instruments as shoun in Fig. 3-1-1.

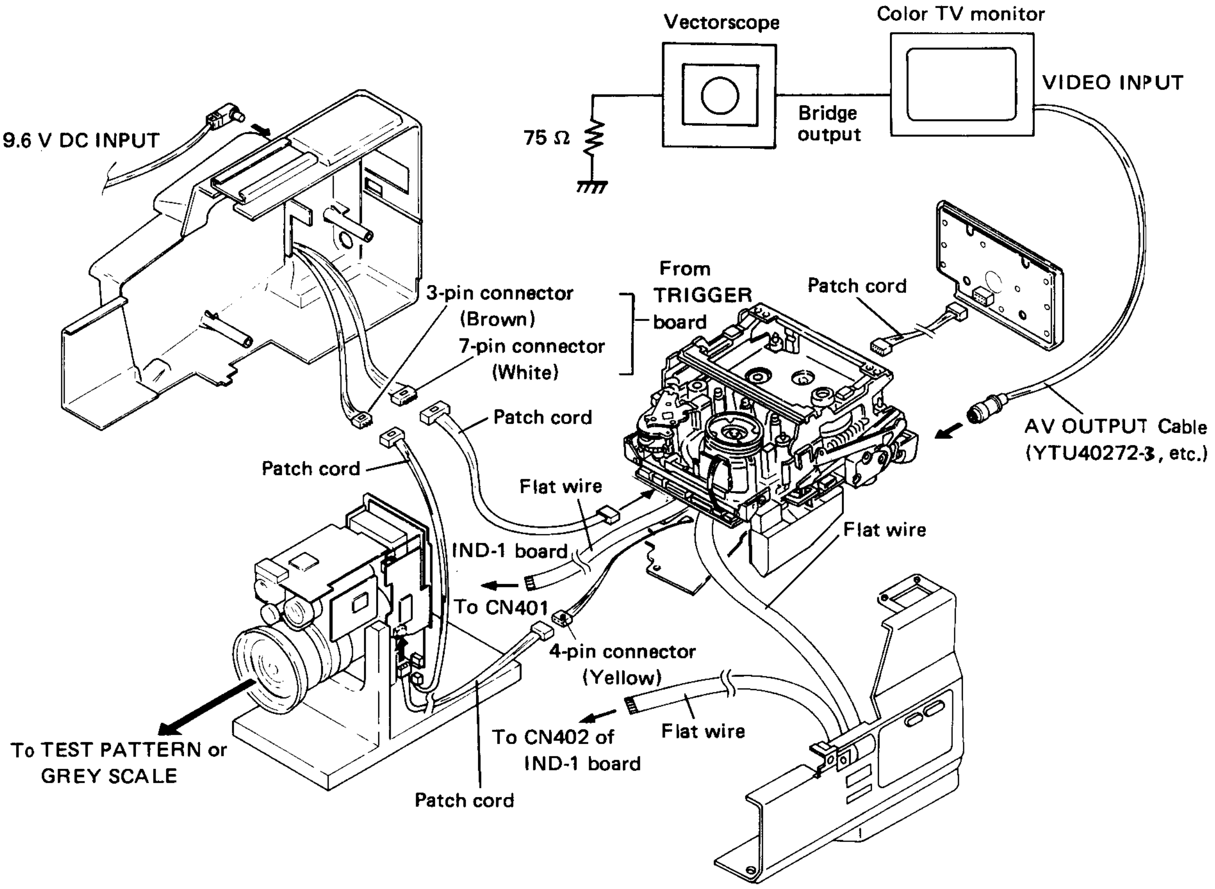
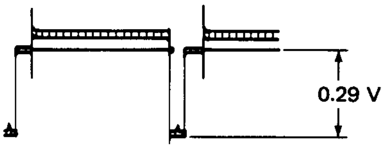
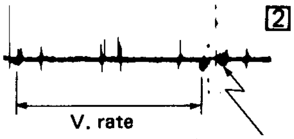
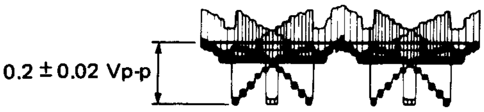
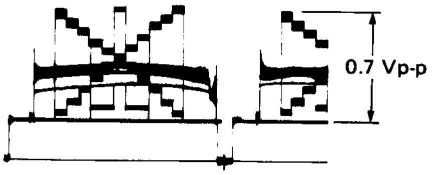
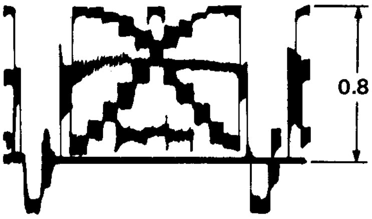

Vectorscope
Color TV monitor
VIDEO INPUT
Bridge output
75 Ω
9.6 V DC INPUT
3-pin connector (Brown)
7-pin connector (White)
From TRIGGER board
Patch cord
Patch cord
Patch cord
Flat wire
IND-1 board
To CN401
AV OUTPUT Cable (YTU40272-3, etc.)
Flat wire
4-pin connector (Yellow)
To CN402 of IND-1 board
Flat wire
To TEST PATTERN or GREY SCALE
Patch cord

Fig. 3-1-1 Connections for adjustment

3.2 Y (LUMINANCE) SIGNAL SYSTEM

Note: Unless otherwise indicated, all test points and adjustment parts are located on [2][1] VIDEO-1 board.
The camera should be set to Rehearsal mode.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	CCD drive frequency	–	• TP104 (CCD DRIVE FREQ)	• C3 (OSC FREQ) [2][1] VIDEO-1	1) Connect a frequency counter to TP104, and adjust C3 to obtain 12.87500 (824 x Fh) MHz ± 40 Hz.
2	Sync level	• Lens closed	• TP303 (Y OUT) [2][3] ENCODER  Fig. 3-2-1 Sync level	• R330 (SYNC LEVEL) [2][3] ENCODER	1) Cap the lens. 2) Adjust R330 so that sync level at TP303 becomes 0.29 V.
3	Detail enhancer balance	• Gray scale	• TP107 (V. EDGE SIGNAL OUT) [2][1] VIDEO-1  Adjust to minimum. Fig. 3-2-2 V. edge noise	• R113 (1H DELAYED SIGNAL LEVEL) [2][1] VIDEO-1	1) Pick up the gray scale and observe waveform at TP107. 2) Adjust R113 to minimize average level of the waveform.
4	Iris	• Gray scale	• TP101 (CDS OUT) [2][1] VIDEO-1  Fig. 3-2-3 Sampling out	• R446 (IRIS) [2][4] IND-1	1) Pick up the gray scale and observe waveform at TP101 with 10 kΩ resistance. 2) Adjust R446 to obtain 0.2 Vp-p of signal level.
	and				
	Y level		• TP303 (Y OUT) [2][3] ENCODER  Fig. 3-2-4 Y level	• R135 (Y LEVEL) [2][1] VIDEO-1	3) Connect the oscilloscope to TP303 and adjust R135 to obtain 0.7 Vp-p of signal level.

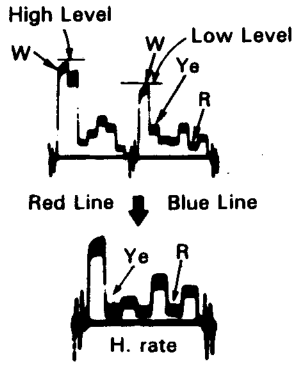
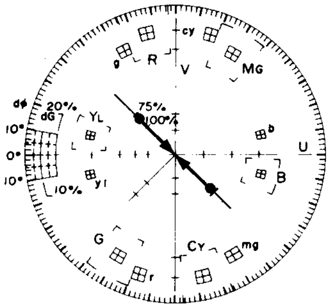
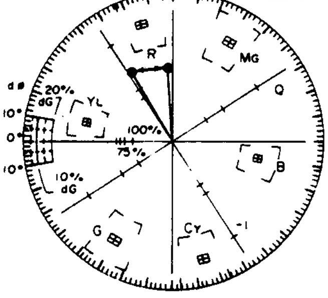
No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
5	White clip level	• Gray scale	• TP303 (Y OUT) [2] [3] ENCODER  Fig. 3-2-5 White clip	• R327 (WHITE CLIP LEVEL) [2] [3] ENCODER	1) Connect the oscilloscope to TP303 and pick up the gray scale pattern. 2) Turn the zoom ring so that the white peak portion is clipped on the oscilloscope screen. 3) Adjust R327 to obtain 0.8 Vp-p of clipping level.
6	AGC	• Lens closed	• IC6 pin 2 (AGC) [2] [1] VIDEO-1	• R54 (AGC) [2] [1] VIDEO-1	1) Cap the lens. 2) Adjust R54 to obtain 1.1 V ± 0.1 V at pin 2 of IC6.
7	Blooming		• TV monitor	• R16 (BLOOMING) [2] [1] VIDEO-1	1) Pick up a fluourscent light and adjust R16 to minimize blooming. **Note:** No matter how further R16 is turned, there will be no change in blooming observed on the monitor. Therefore, set R16 to a position where blooming becomes minimum for the first time and won't change any more even if R16 is turned further.
8	Indicator (indication adj.)	• Lens capped • Manual focusing	• E. VF indication	• R402 (IND OSC) [2] [4] IND-1	1) Turn the focus lens subtly until the "Correct focus" indication appears in the electronic viewfinder. 2) Adjust R402 to position the "Correct focus" indication in the center of the viewfinder screen.

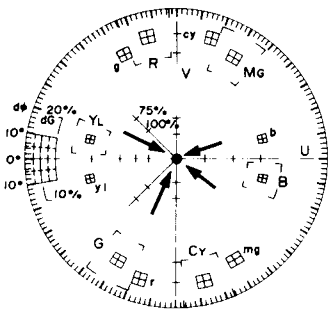
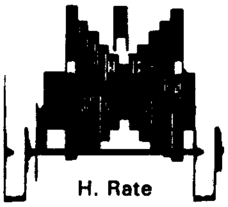
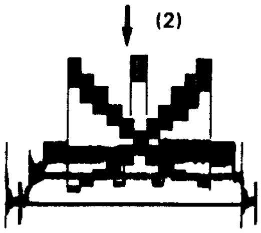
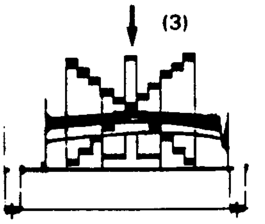
3.3 COLOR SIGNAL SYSTEM

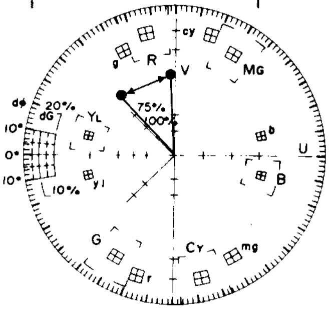
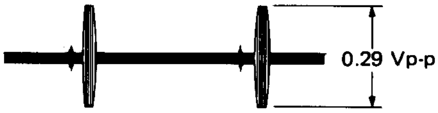
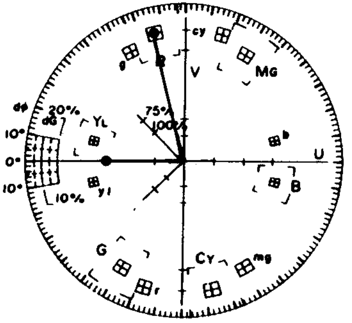
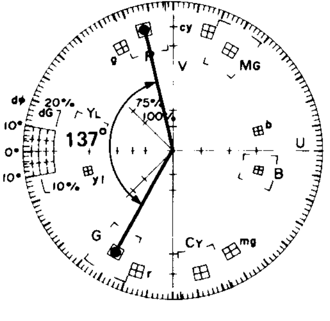
3.3.1 Basic indoor mode

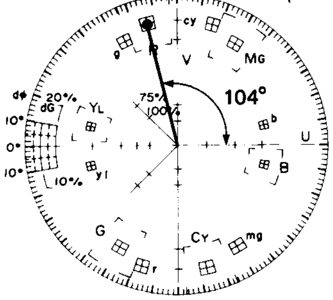
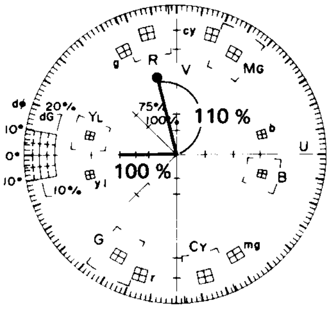
Note: Unless otherwise indicated, all test points and adjustment parts are located on [2][1] VIDEO-1 board.
For adjustment, set the controls to the following positions unless otherwise specified.

Focus : MANUAL
White Balance : PRESET INDOOR
Shutter Speed : STANDARD

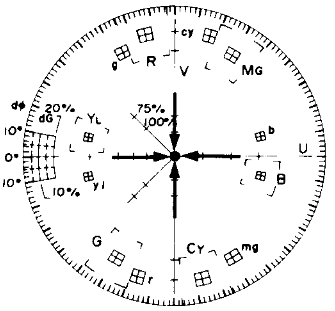
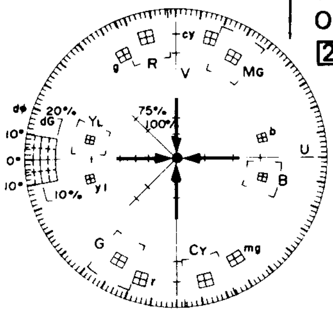
No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	R/B separation	• Color bar • Just scan	• TP103 (R IN) • TP102 (B IN) [2][1] VIDEO-1 • TP303 (Y OUT) (Ext. trigger) [2][3] ENCODER  Fig. 3-3-1 R/B separation	• R63 (R SEP) • R62 (B SEP) [2][1] VIDEO-1	1) Pick up the color bar pattern with just scan. 2) Connect the oscilloscope to TP103 and TP303 (for external trigger) on the ENCODER board. 3) Taking notice of the blue line, adjust R63 so that yellow level becomes equal to red level. **Note:** The blue line means the scanning line that is the small in signal level of the color for pattern's white section. 4) In the same manner as in the step 2), observe TP102 and adjust R62 to equalize signal levels of the color pattern's yellow and red sections.
2	Chroma offset	• Lens closed	• Vectorscope  Fig. 3-3-2 Chroma offset	• R149 (CHROMA OFFSET) [2][1] VIDEO-1	1) Cap the lens. 2) Adjust R149 so that dots meet with each other at the same point on the vectorscope.
3	Color difference balance	• Color bar • Just scan	• Vectorscope  Fig. 3-3-3 C. difference balance	• R154 (CD BALANCE) [2][1] VIDEO-1	1) Pick up the color bar pattern with just scan. 2) Adjust R154 so that each dot is positioned at the same point being into one (to minimize the red signal's movement).

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
4	Encoder balance	• Lens closed	• Vectorscope  cy R V MG dφ 20% dG YL 75% 100% 10° 0° 10° U B 10% yl G CY mg r Fig. 3-3-4 Carrier balance	• R344 (R ENCODER BAL) • R345 (B ENCODER BAL) • R375 (B LINE SW CARR) • R376 (R LINE SW CARR) [2] [3] ENCODER	1) With the lens closed, short TP106 (SETUP Vcc) to GND for zero setup level. 2) Adjust R344, R345, R375 and R376 to center every dot on the vectorscope alternately.
5	White balance	• Gray scale • Just scan	• TP304 (COLOR OUT) [2] [3] ENCODER		1) Pick up the gray scale pattern with just scan and observe H-rate waveform at TP304 on the ENCODER board.
			 Fig. 3-3-5 White balance - 1	• R76 (B SETUP) • R75 (R SETUP) [2] [2] VIDEO-1	2) Adjust R76 and R75 alternately so that carrier leakage of low level becomes minimum.
			 Fig. 3-3-6 White balance - 2	• R66 (B GAIN) • R65 (R GAIN) [2] [2] VIDEO-1	3) Adjust R66 and R65 alternately so that carrier leakage of white peak level becomes minimum. 4) Repeat steps 2) and 3) several times to minimize carrier leakage all over. **Note:** Confirm that dot is positioned at the center of the vectorseope to minimize the carrier leckage.
			 Fig. 3-3-7 White balance - 3		

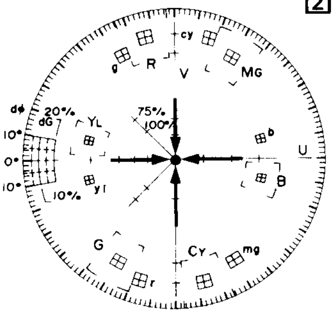
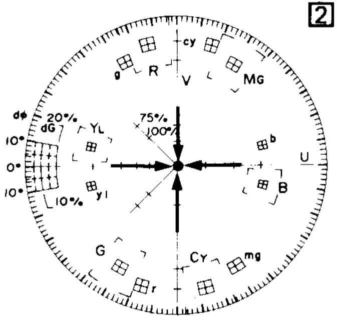
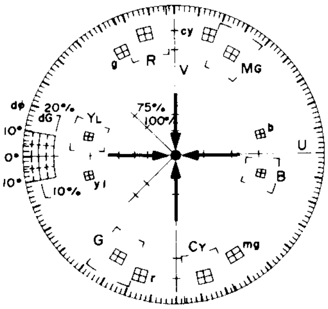
No.	Item	Mode & Signal	Test Point Waveform & Adjustment	Adjustment Parts	Procedure
6	Sub carrier phase	• Color bar • Just scan	• Vectorscope  Fig. 3-3-8 C. difference balance	• R347 (SUB CARR PHASE) $\boxed{2}\boxed{3}$ ENCODER	1) Pick up the color bar pattern with just scan. 2) Adjust R347 so that RED dots meet with each other at the same point on the vectorscope. 3) If necessary, check Item 3, color difference balance.
7	Burst level	• Lens closed	• TP304 (COLOR OUT) $\boxed{2}\boxed{3}$ ENCODER  Fig. 3-3-9 Burst	• R353 (BURST LEVEL) $\boxed{2}\boxed{3}$ ENCODER	1) Close the lens with the lens cap. 2) Connect the oscilloscope to TP304 and adjust R353 to obtain 0.29 V as the burst level.
8	Burst phase	• Color bar • Just scan	• Vectorscope  Fig. 3-3-10 Burst phase	• R364 (BURST PHASE) $\boxed{2}\boxed{3}$ ENCODER	1) Pick up the color bar pattern with just scan. 2) While observing the vectorscope and the TV monitor, adjust R364 so that phase of the red section is matched to the red phase direction of the vectorscope.
9	Color phase	• Color bar • Just scan	• Vectorscope • TP304 (COLOR OUT) $\boxed{2}\boxed{3}$ ENCODER  Fig. 3-3-11 B-Y gain	• R125 (B-Y LEVEL) $\boxed{2}\boxed{1}$ VIDEO-1	1) Pick up the color bar pattern with just scan. 2) Adjust R125 so that phase difference between R and G becomes nearly 137° on the vectorscope.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
10	Red phase	• Color bar • Just scan	• Vectorscope • TP304 (COLOR OUT) [2] [3] ENCODER  Fig. 3-3-12 Red phase	• R385 (RED PHASE) [2] [3] ENCODER	1) Pick up the color bar pattern with just scan. 2) Adjust R364 so that phase difference of R becomes nearly 104° on the vectorscope.
11	Color level	• Color bar	• Vectorscope  Fig. 3-3-13 Color level	• R356 (CHROMA GAIN) [2] [3] ENCODER	1) Pick up the color bars. 2) Adjust R356 so that color level of the red section of the color bars become 1.1 time larger than the burst level of 0.29 Vp-p. 3) Repeat adjustments of items No. 9 through No. 11 several times to get the natural color on the TV Monitor.

3.3.2 Preset white balance

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Preset FL	• Gray scale • Preset FL	• Vectorscope  cy R V MG d 20% dG YL 75% 100% 10° 0° 10° 10% yl b U B G CY mg r Fig. 3-3-14 Preset FL	• R539 (PRESET FLR) $\boxed{2}\boxed{5}$ FAW	1) Pick up the gray scale. 2) Fix C10 and CC30 Y filters to the camera lens. 3) Adjust R539 so that every dot centers on the vectorscope.
2	Preset OUTDOOR	• Preset OUT-DOOR • Gray scale	• Vectorscope  cy R V MG d 20% dG YL 75% 100% 10° 0° 10° 10% yl b U B G CY mg r Fig. 3-3-15 Preset OUTDOOR	• R527 (PRESET B OUTDOOR • R547 (PRESET R OUTDOOR) $\boxed{2}\boxed{5}$ FAW	1) Fix C12 cold filter to the camera lens and pick up the gray scale. 2) Adjust R527 and R547 to position all dots at the center of the vectorscope.

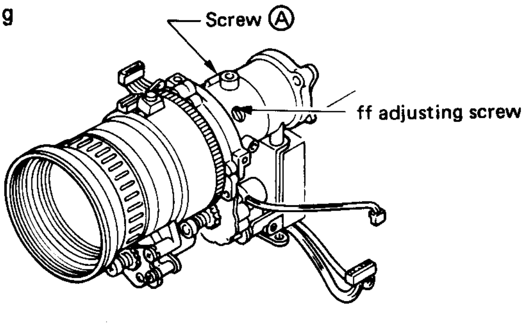
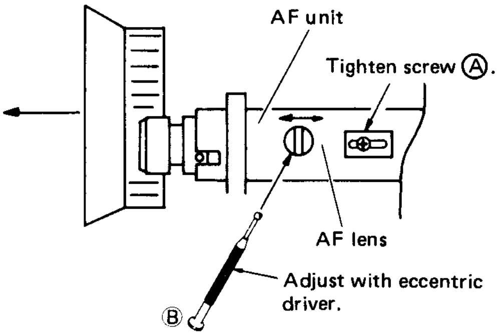
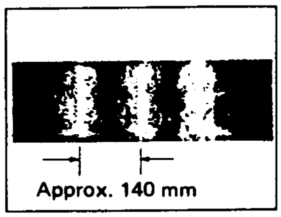
3.3.3 Automatic white balance

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Auto white INDOOR	• AW (Auto White) • Gray scale	• Vectorscope  Fig. 3-1-16 AW (Auto white) INDOOR	• R503 (AW INDOOR B) • R506 (AW INDOOR R) 2 5 FAW	1) Pick up the gray scale. 2) Adjust R503 and R506 so that all dots are positioned at the center of the vectorscope screen. 3) If necessary, check INDOOR Limiter.
2	Auto white OUTDOOR	• AW (Auto White) • Gray scale	• Vectorscope  Fig. 3-3-17 AW (Auto white) OUTDOOR	• R559 (AW OUTDOOR B) • R563 (AW OUTDOOR R) 2 5 FAW	1) Fix C12 filter to the camera lens while C14 filter to the sensor, and pick up the gray scale. 2) Adjust R559 and R563 to position all dots at the center of the vectorscope. 3) If necessary, check OUTDOOR Limiter.
3	IN-/OUT-DOOR Limiter	• AW (Auto White) • Gray scale	• Vectorscope  Fig. 3-3-18 IN-/OUTDOOR limiter	• R515 (AW IN R LIM) • R535 (AW IN B LIM) • R519 (AW OUT R LIM) • R531 (AW OUT B LIM) 2 5 FAW	1) Fix W4 filter to the camera lens while W14 to the sensor, and pick up the gray scale. 2) Adjust R515 and R535 to position all dots at the center of the vectorscope. 3) Fix C16 filter to the camera lens while C24 filter to the sensor, and pick up the gray scale. 4) Adjust R519 and R531 to position all dots at the center of the vectorscope.

3.4 TITLE POSITION ADJUSTMENT

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Title indication width	• Rehearsal • Lens capped	• TV monitor • TP303 (Y OUT) 23 ENCODER	• R801 (TITLE OSC) 27 IND-2	1) Close the camera lens with the lens cap, and press the TITLE MEMORY button. 2) Take off the lens cap and pick up an optional camera subject. 3) Observe TP303's waveform at H-rate, and adjust R801 so that video scanning period and title signal coincide with each other.

3.5 FOCUS INDICATOR POSITION ADJUSTMENT

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Back focus	• Rehearsal • Subject in the distance of 3 m or farther • Iris: Opened (with ND filter) • Manual focusing	• on TV monitor  Fig. 3-5-1 Back focus position	• Master Lens	1) Attach a proper ND filter to the camera lens to open the iris fully in the daylight, and set the focus lens to " ∞ " position. 2) After the setscrew is loosened, slowly turn the ff adlusting screw to focus the lens observing the TV monitor. 3) Set the zoom lens to "54" focal distance and confirm that the subject is in focus. 4) Set the focus lens to "2 m" subject distance, and shoot a camera subject in the distance of 2 m. In this state, confirm that the image is in focus in two ways that the focal distance of the zoom lens is set to "54" and "9" positions. 5) Tighten the setscrew Ⓐ and lock the back focus adjusting screw.
2	AF (Auto Focus) adj.	• Rehearsal • Subject in the distance of 2 m • Focus SW: AUTO • Auto focus chart • Iris: Opened	• on TV monitor  AF unit Tighten screw Ⓐ. AF lens Adjust with eccentric driver. Ⓑ Fig. 3-5-2 AF adjusting point  Fig. 3-5-3 AF chart	• AF Lens	**Note:** Prior to auto focus adjustment, confirm that back focus of the camera has been correctly adjusted. 1) Set up the auto focus adjustment chart and the camera so that the distance between the chart and the front lens is 2 m approx. 2) Shoot the chart (shown in Fig. 3-5-3) as it is lifted up by the left side to have a tilt at 20° to the horizon. 3) After loosening the screw Ⓐ under the AF unit (see Fig. 3-5-2), insert an eccentric driver into the AF lens hole. 4) Focus the camera on the chart by moving the AF lens with the eccentric driver to the front and the rear. 5) Tighten the screw Ⓐ.

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
3	Focus bias	• Subject in the distance of 2 ~ 3 m • Focus SW: AUTO • AF chart • Iris: Opened	• TV monitor • E. VF "Correct focus" indication	• VR4 (FOCUS BIAS) AF board	1) Pick up the AF chart with AF mode. 2) Turn the focusing ring to telephoto. Confirm that auto focusing is correct. 3) Turn the focus ring to wide. Confirm that auto focusing is correct. 4) If necessary, adjust VR4 to satisfy steps 2) and 3).

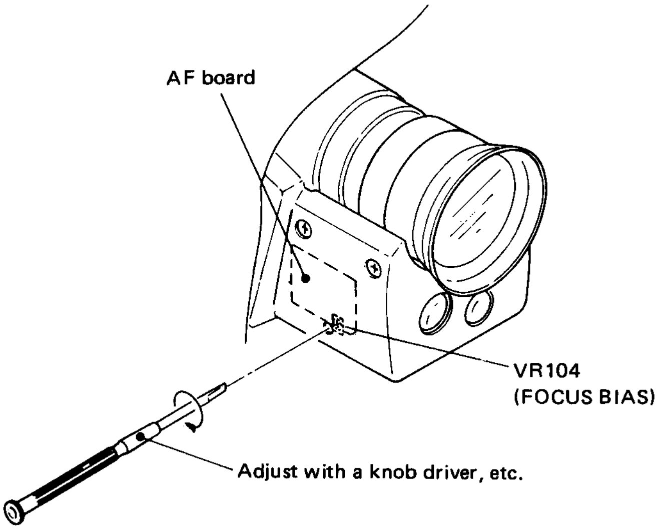

AF board
VR104
(FOCUS BIAS)
Adjust with a knob driver, etc.

Fig. 3-5-4 Focus bias position

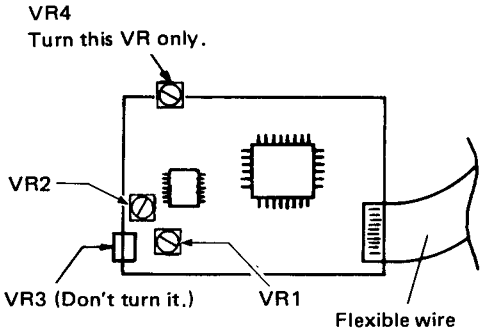
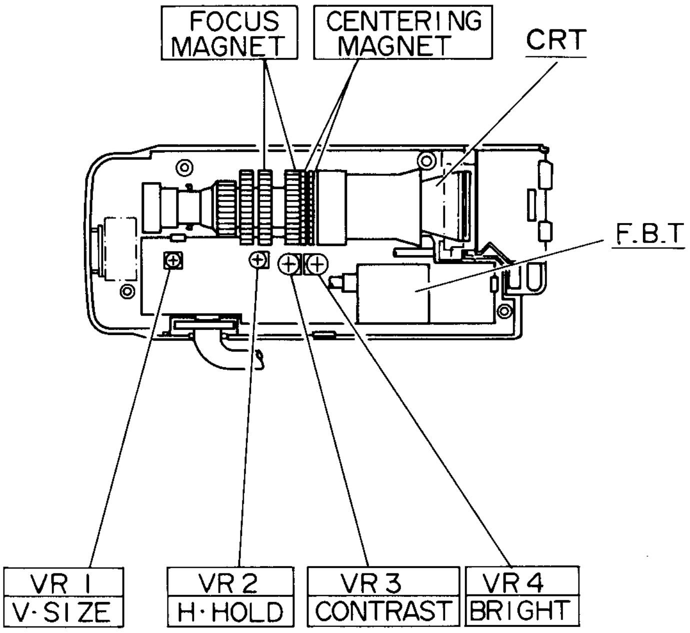

VR4
Turn this VR only.
VR2
VR3 (Don't turn it.)
VR1
Flexible wire

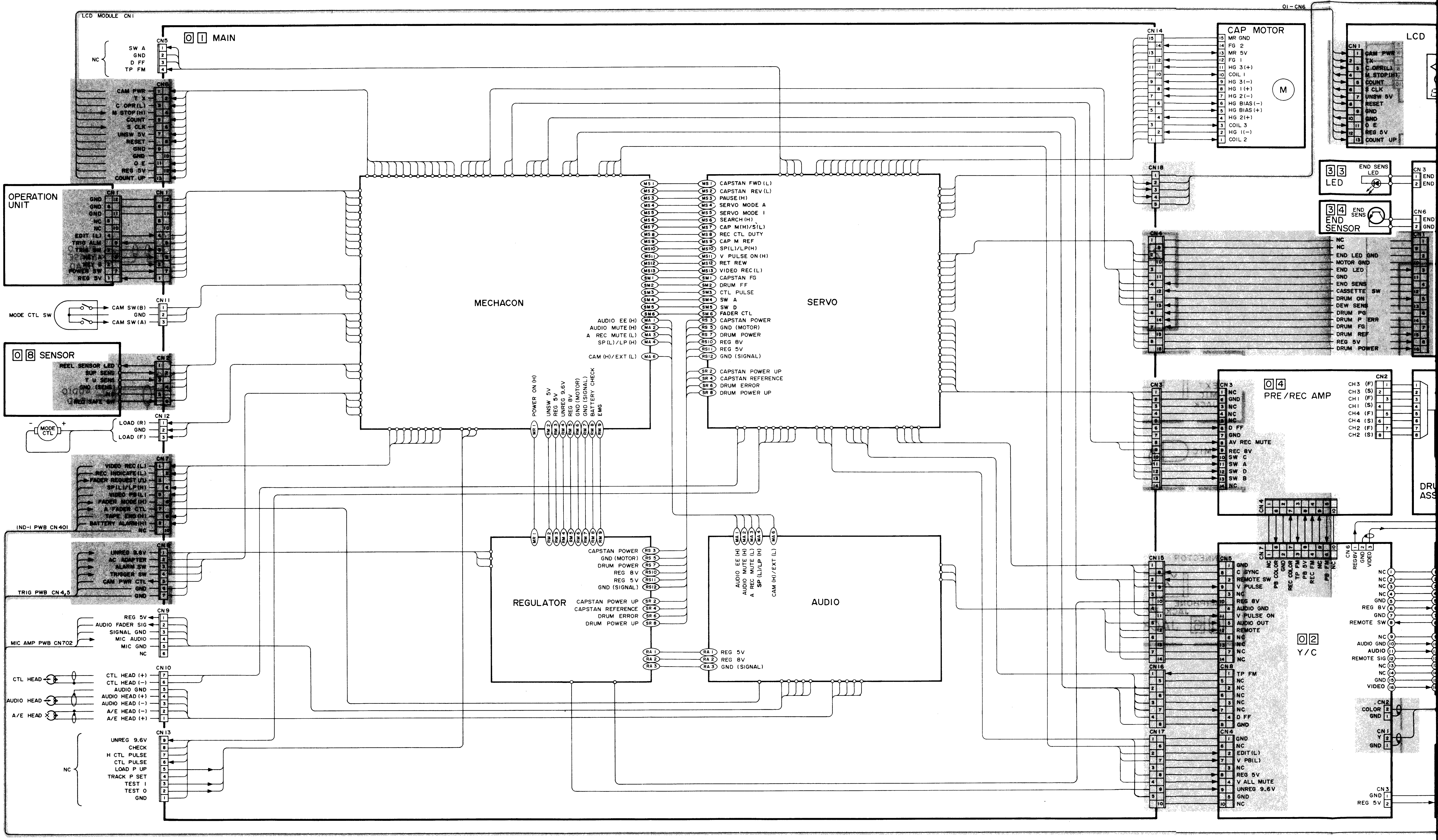
Fig. 3-5-5 Location of VRs

3.6 E. VF (ELECTRONIC VIEWFINDER) ADJUSTMENT

No.	Item	Mode & Signal	Test Point	Adjustment Parts	Procedure
			Waveform & Adjustment		
1	Horizontal sync.  FOCUS MAGNET CENTERING MAGNET CRT F.B.T VR 1 V·SIZE VR 2 H·HOLD VR 3 CONTRAST VR 4 BRIGHT	• MH-C2 Gray scale (PB)	• E. VF	• VR2 (H. HOLD) 5 0 VF board	1) Observing the viewfinder screen, turn VR2 full clockwise to make the picture unstable. 2) Gradually return VR2 counterclockwise until the picture becomes stable. Mark the VR position where the picture is completely stabilized. 3) Next, turn VR2 full counterclockwise to make the picture unstable similarly to the above step 1). 4) Gradually return VR2 clockwise until the picture becomes stable, and mark the position of VR2. 5) Set VR2 to the midpoint between the two markings in the steps 2) and 4). **Note:** It is the correct VR setting by which DC voltage at pin 12 of IC1 is 3.0 V.
2	Vertical scanning	• MH-C2 Gray scale PB	• E. VF	• VR1 (V. SIZE) 5 0 VF board	1) Observing the viewfinder, adjust VR1 for normal picture amplitude.
3	Centering	• MH-C2 Gray scale PB	• E. VF	• Centering Magnet	1) Adjust the centering magnet so that the gray scale image appears in the center of the viewfinder screen.
4	Focus	• MH-C2 Gray scale PB	• E. VF	• Focus Magnet	1) Observing the viewfinder, adjust the focus magnet of the deflection yoke to obtain a clear picture in the center of the gray scale.
5	Brightness	• Iris: Closed (Lens capped)	• E. VF	• VR4 (BRIGHT) 5 0 VF board	1) Close the iris and adjust VR4 so that the raster of CRT is just barely visible in the viewfinder.
6	Contrast	• MH-C2 Gray scale PB	• E. VF	• VR3 (CONT) 5 0 VF board	1) Observing the viewfinder screen, adjust VR3 so that gradation of the gray scale becomes the best.

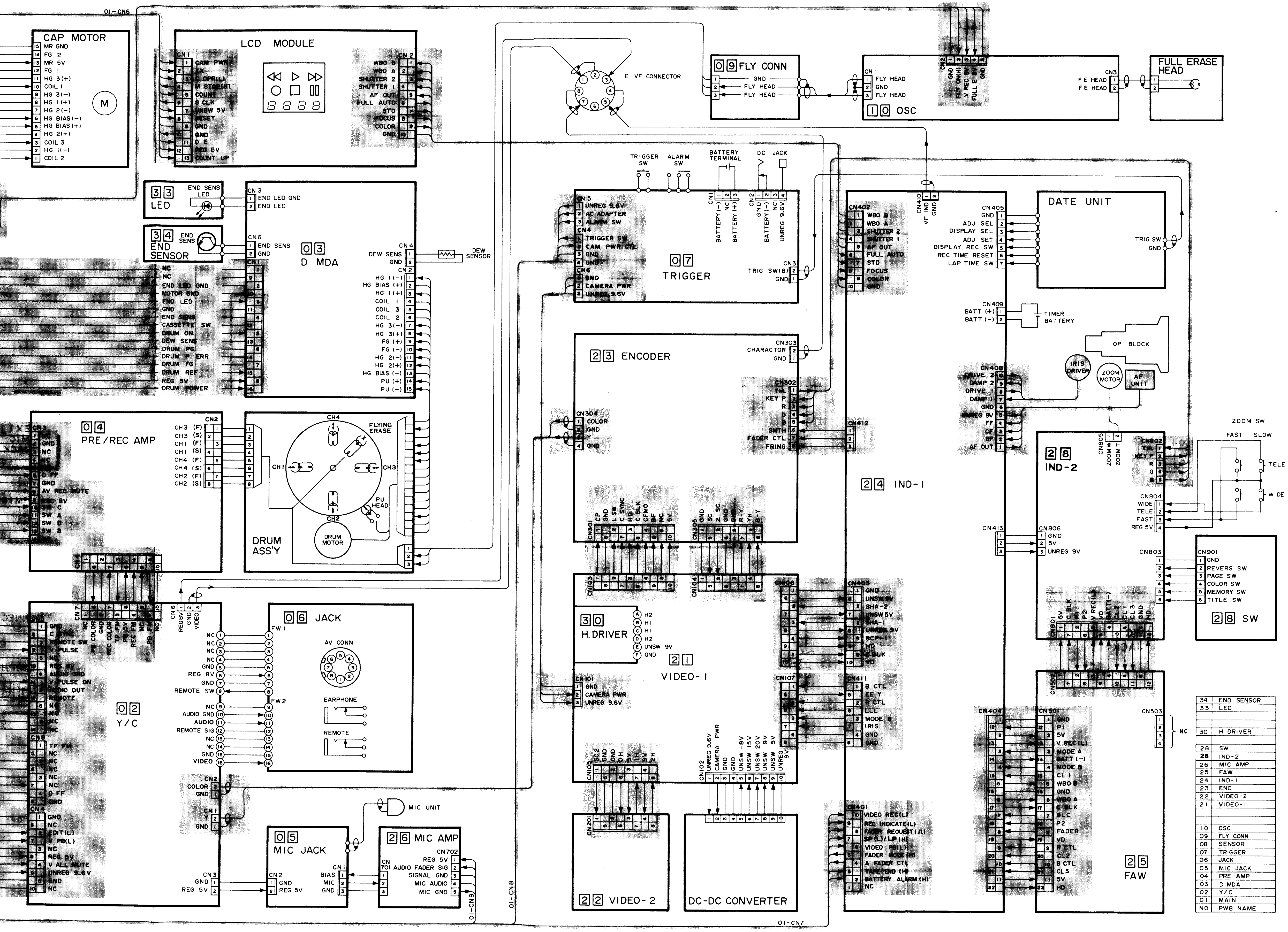
SECTION 4
OVERALL WIRING AND BLOCK DIAGRAMS

4.1 OVERALL WIRING



LCD MODULE CN1
01-CN6
01 MAIN
CN5
NC
SW A
GND
D FF
TP FM
CN6
CAM PWR
T X
C OPR(L)
M STOP(H)
COUNT
S CLK
UNSW 5V
RESET
GND
GND
O E
REG 5V
COUNT UP
OPERATION UNIT
CN1
GND
GND
GND
NC
NC
EDIT (L)
TRIG ALM
REG 5V
CN11
MODE CTL SW
CAM SW(B)
GND
CAM SW(A)
08 SENSOR
CN2
REEL SENSOR LED
SUP SENS
T U SENS
GND (SENS)
REC SAFE SW
CN12
MODE CTL
LOAD (R)
GND
LOAD (F)
CN7
VIDEO REC(L)
REC INDICATE(L)
FADER REQUEST (L)
SP(L)/LP(H)
VIDEO PB(L)
FADER MODE (H)
A FADER CTL
TAPE END(H)
BATTERY ALARM(H)
NC
IND-1 PWB CN401
CN8
UNREG 9.6V
AC ADAPTER
ALARM SW
TRIGGER SW
CAM PWR CTL
GND
GND
TRIG PWB CN4,5
CN9
REG 5V
AUDIO FADER SIG
SIGNAL GND
MIC AUDIO
MIC GND
NC
MIC AMP PWB CN702
CN10
CTL HEAD
CTL HEAD (+)
CTL HEAD (−)
AUDIO GND
AUDIO HEAD
AUDIO HEAD (+)
AUDIO HEAD (−)
A/E HEAD
A/E HEAD (−)
A/E HEAD (+)
CN13
NC
UNREG 9.6V
CHECK
H CTL PULSE
CTL PULSE
LOAD P UP
TRACK P SET
TEST I
TEST O
GND
MECHACON
SERVO
MS1 CAPSTAN FWD (L)
MS2 CAPSTAN REV (L)
MS3 PAUSE (H)
MS4 SERVO MODE A
MS5 SERVO MODE I
MS6 SEARCH (H)
MS7 CAP M(H)/S(L)
MS8 REC CTL DUTY
MS9 CAP M REF
MS10 SP(L)/LP(H)
MS11 V PULSE ON (H)
MS12 RET REW
MS13 VIDEO REC (L)
SM1 CAPSTAN FG
SM2 DRUM FF
SM3 CTL PULSE
SM4 SW A
SM5 SW D
SM6 FADER CTL
AUDIO EE (H) MA1
AUDIO MUTE (H) MA2
A REC MUTE (L) MA3
SP(L)/LP (H) MA4
CAM (H)/EXT (L) MA6
RS3 CAPSTAN POWER
RS5 GND (MOTOR)
RS7 DRUM POWER
RS10 REG 8V
RS11 REG 5V
RS12 GND (SIGNAL)
SR2 CAPSTAN POWER UP
SR4 CAPSTAN REFERENCE
SR6 DRUM ERROR
SR8 DRUM POWER UP
MR1 POWER ON (H)
RM2 UNSW 5V
RM3 REG 5V
RM4 UNREG 9.6V
RM5 REG 8V
RM6 GND (MOTOR)
RM7 GND (SIGNAL)
RM8 BATTERY CHECK
RM9 EMG
REGULATOR
CAPSTAN POWER RS3
GND (MOTOR) RS5
DRUM POWER RS7
REG 8V RS10
REG 5V RS11
GND (SIGNAL) RS12
CAPSTAN POWER UP SR2
CAPSTAN REFERENCE SR4
DRUM ERROR SR6
DRUM POWER UP SR8
RA1 REG 5V
RA2 REG 8V
RA3 GND (SIGNAL)
AUDIO
MA1 AUDIO EE (H)
MA2 AUDIO MUTE (H)
MA3 A REC MUTE (L)
MA4 SP (L)/LP (H)
MA6 CAM (H)/EXT (L)
CN14
CAP MOTOR
MR GND
FG 2
MR 5V
FG I
HG 3(+)
COIL I
HG 3(−)
HG I(+)
HG 2(−)
HG BIAS(−)
HG BIAS(+)
HG 2(+)
COIL 3
HG I(−)
COIL 2
M
LCD
CN1
CAM PWR
TX
C OPR(L)
M STOP(H)
COUNT
S CLK
UNSW 5V
RESET
GND
GND
O E
REG 5V
COUNT UP
CN18
33 LED
END SENS LED
CN3
END
END
34 END SENSOR
END SENS
CN6
END
GND
CN4
NC
NC
END LED GND
MOTOR GND
END LED
GND
END SENS
CASSETTE SW
DRUM ON
DEW SENS
DRUM PG
DRUM P ERR
DRUM FG
DRUM REF
REG 5V
DRUM POWER
CN3
04 PRE/REC AMP
NC
GND
NC
NC
NC
D FF
GND
AV REC MUTE
REC 8V
SW C
SW A
SW D
SW B
NC
CN2
CH3 (F)
CH3 (S)
CH1 (F)
CH1 (S)
CH4 (F)
CH4 (S)
CH2 (F)
CH2 (S)
DRU ASS
CN4
CN7
NC
PB COLOR
GND
REC COLOR
TP FM
PB 5V
REC FM
NC
PB FM
NC
CN6
REG8V
GND
VIDEO
CN15
CN5
GND
C SYNC
REMOTE SW
V PULSE
NC
REG 8V
AUDIO GND
V PULSE ON
AUDIO OUT
REMOTE
NC
NC
NC
NC
02 Y/C
CN16
CN8
TP FM
NC
NC
NC
NC
NC
D FF
GND
CN17
CN4
GND
NC
EDIT(L)
V PB(L)
NC
REG 5V
V ALL MUTE
UNREG 9.6V
GND
NC
NC
NC
NC
NC
GND
REG 8V
GND
REMOTE SW
NC
AUDIO GND
AUDIO
REMOTE SIG
NC
NC
GND
VIDEO
CN2
COLOR
GND
CN1
Y
GND
CN3
GND
REG 5V

IS


01-CN6
CAP MOTOR
LCD MODULE
E VF CONNECTOR
09 FLY CONN
10 OSC
FULL ERASE HEAD
33 LED
34 END SENSOR
03 D MDA
DEW SENSOR
TRIGGER SW
ALARM SW
BATTERY TERMINAL
DC JACK
07 TRIGGER
24 IND-1
DATE UNIT
TIMER BATTERY
OP BLOCK
IRIS DRIVER
ZOOM MOTOR
AF UNIT
23 ENCODER
04 PRE/REC AMP
DRUM ASS'Y
DRUM MOTOR
FLYING ERASE
PU HEAD
28 IND-2
ZOOM SW
FAST
SLOW
TELE
WIDE
28 SW
02 Y/C
06 JACK
AV CONN
EARPHONE
REMOTE
30 H.DRIVER
21 VIDEO-1
25 FAW
05 MIC JACK
26 MIC AMP
MIC UNIT
22 VIDEO-2
DC-DC CONVERTER
01-CN8
01-CN9
01-CN7

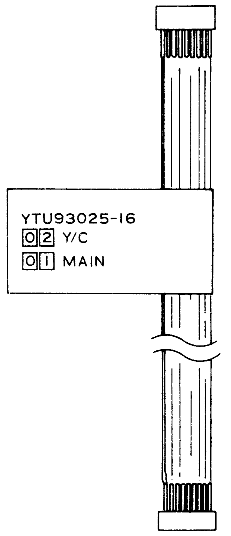
34	END SENSOR
33	LED
30	H DRIVER
28	SW
28	IND-2
26	MIC AMP
25	FAW
24	IND-1
23	ENC
22	VIDEO-2
21	VIDEO-1
10	OSC
09	FLY CONN
08	SENSOR
07	TRIGGER
06	JACK
05	MIC JACK
04	PRE AMP
03	D MDA
02	Y/C
01	MAIN
NO	PWB NAME

Patchcords

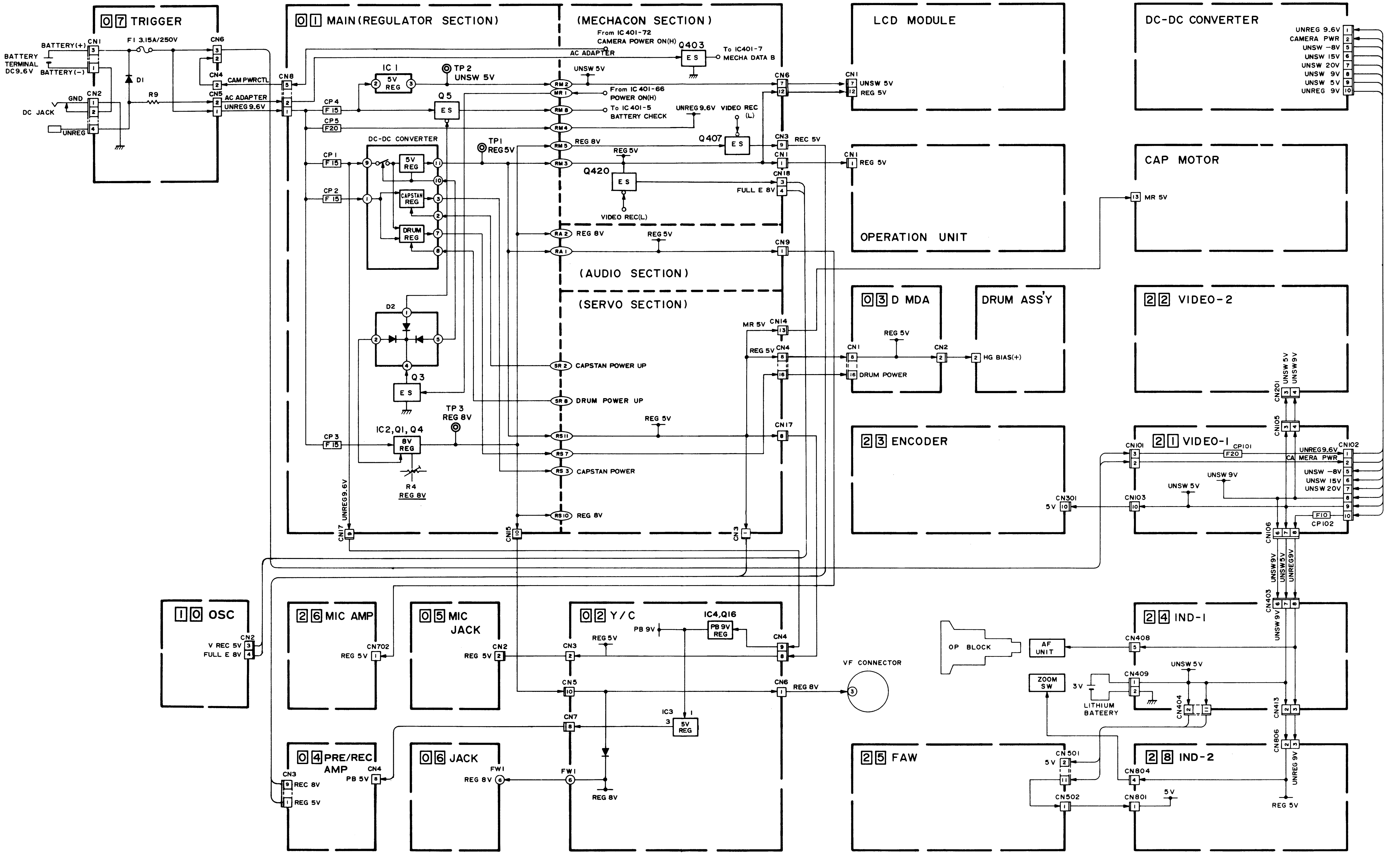
Patchcords are available for blue shaded portions of the overall wiring.

The patchcords are provided with **tags** to indicate connection points. Connect as indicated.

Example: As shown in the Figure, connect one side to MAIN board and the other to Y/C board.

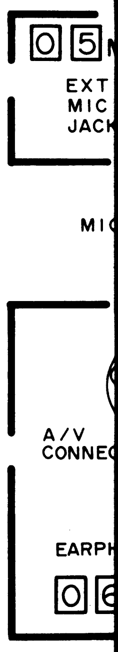

YTU93025-16
02 Y/C
01 MAIN

4.2 POWER SYSTEM BLOCK DIAGRAM



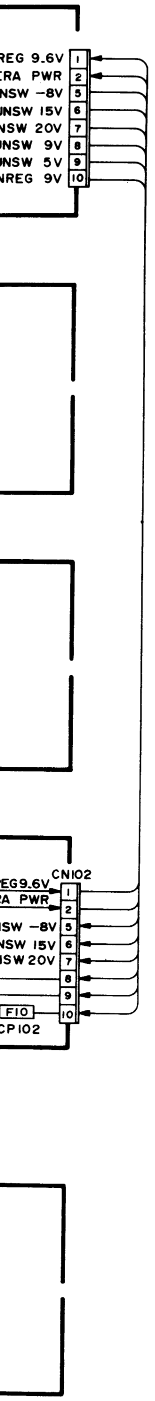
07 TRIGGER
BATTERY TERMINAL DC9.6V
BATTERY(+)
BATTERY(-)
CN1
F1 3.15A/250V
CN6
D1
CN4
CAM PWRCTL
GND
CN2
R9
CN5
AC ADAPTER
UNREG 9.6V
DC JACK
UNREG
01 MAIN (REGULATOR SECTION)
(MECHACON SECTION)
From IC401-72 CAMERA POWER ON(H)
Q403
ES
To IC401-7 MECHA DATA B
AC ADAPTER
CN8
IC1
5V REG
TP2 UNSW 5V
UNSW 5V
From IC401-66 POWER ON(H)
To IC401-5 BATTERY CHECK
CP4 F15
CP5 F20
Q5
UNREG 9.6V
VIDEO REC (L)
Q407
DC-DC CONVERTER
TP1 REG5V
REG 8V
REG 5V
CP1 F15
CP2 F15
CAPSTAN REG
DRUM REG
Q420
FULL E 8V
VIDEO REC(L)
RM2
RM1
RM8
RM4
RM5
RM3
RA2
RA1
REG 8V
REG 5V
(AUDIO SECTION)
(SERVO SECTION)
D2
Q3
SR2 CAPSTAN POWER UP
SR8 DRUM POWER UP
TP3 REG 8V
IC2,Q1,Q4
8V REG
CP3 F15
R4 REG 8V
RS11
RS7
RS3 CAPSTAN POWER
RS10 REG 8V
UNREG 9.6V
CN17
CN15
CN3
CN6
CN3
REC 5V
CN1
CN18
CN9
MR 5V
CN14
REG 5V
CN4
CN17
LCD MODULE
CN1
UNSW 5V
REG 5V
OPERATION UNIT
REG 5V
DC-DC CONVERTER
UNREG 9.6V
CAMERA PWR
UNSW -8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
UNREG 9V
CAP MOTOR
MR 5V
03 D MDA
REG 5V
CN2
DRUM POWER
DRUM ASS'Y
HG BIAS(+)
22 VIDEO-2
CN201
UNSW 5V
UNSW 9V
CN105
23 ENCODER
CN301
5V
21 VIDEO-1
CN101
CP101
F20
CN102
UNREG 9.6V
CAMERA PWR
UNSW -8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
CN103
F10
CP102
CN106
UNSW9V
UNSW5V
UNREG9V
10 OSC
CN2
V REC 5V
FULL E 8V
26 MIC AMP
CN702
REG 5V
05 MIC JACK
CN2
REG 5V
02 Y/C
IC4,Q16
PB 9V
PB 9V REG
REG 5V
CN3
CN4
CN5
CN6
REG 8V
CN7
IC3
5V REG
VF CONNECTOR
FW1
REG 8V
04 PRE/REC AMP
CN3
REC 8V
REG 5V
CN4
PB 5V
06 JACK
FW1
REG 8V
OP BLOCK
AF UNIT
ZOOM SW
3V
LITHIUM BATEERY
24 IND-1
CN403
UNSW 9V
CN408
CN409
UNSW 5V
CN404
CN413
25 FAW
CN501
5V
CN502
28 IND-2
CN806
UNREG 9V
CN804
CN801
5V
REG 5V

4.3 AUDIO BL

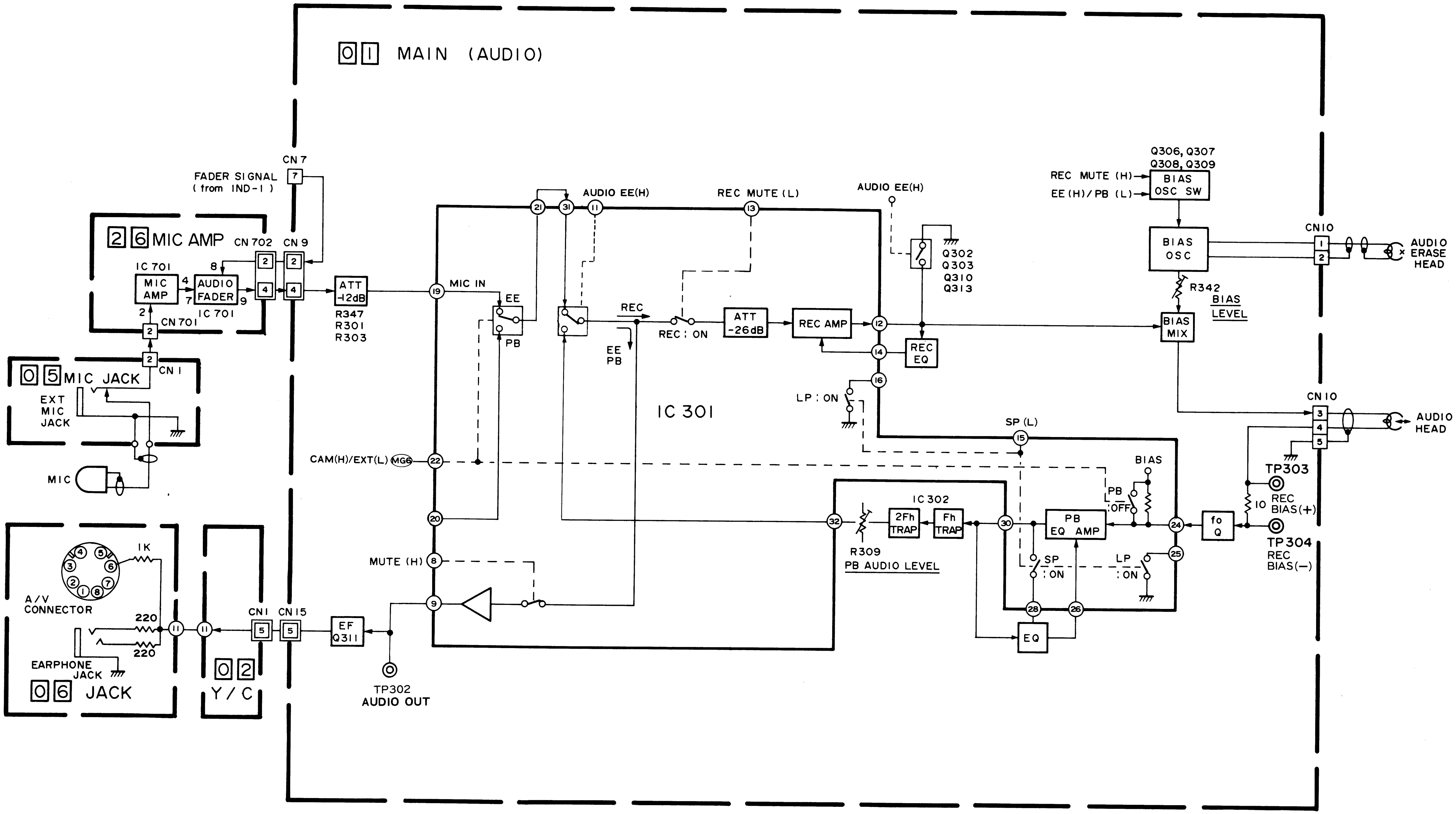


05
EXT
MIC
JACK
MI
A/V
CONNE
EARPH
06

4.3 AUDIO BLOCK DIAGRAM

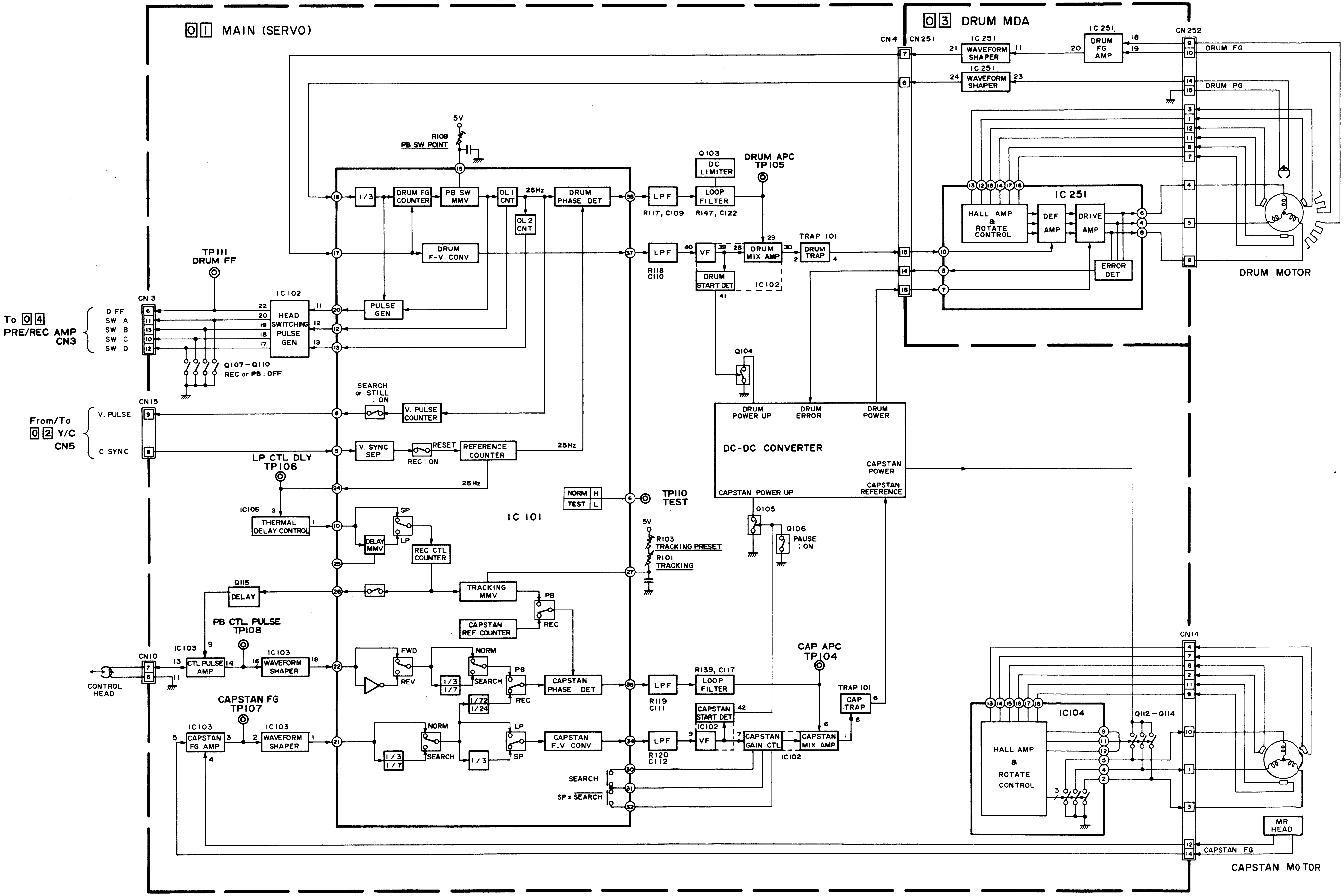


REG 9.6V
RA PWR
NSW -8V
NSW 15V
NSW 20V
NSW 9V
NSW 5V
NREG 9V
1
2
5
6
7
8
9
10
CN102
EG9.6V
A PWR
SW -8V
SW 15V
SW 20V
F10
CP102



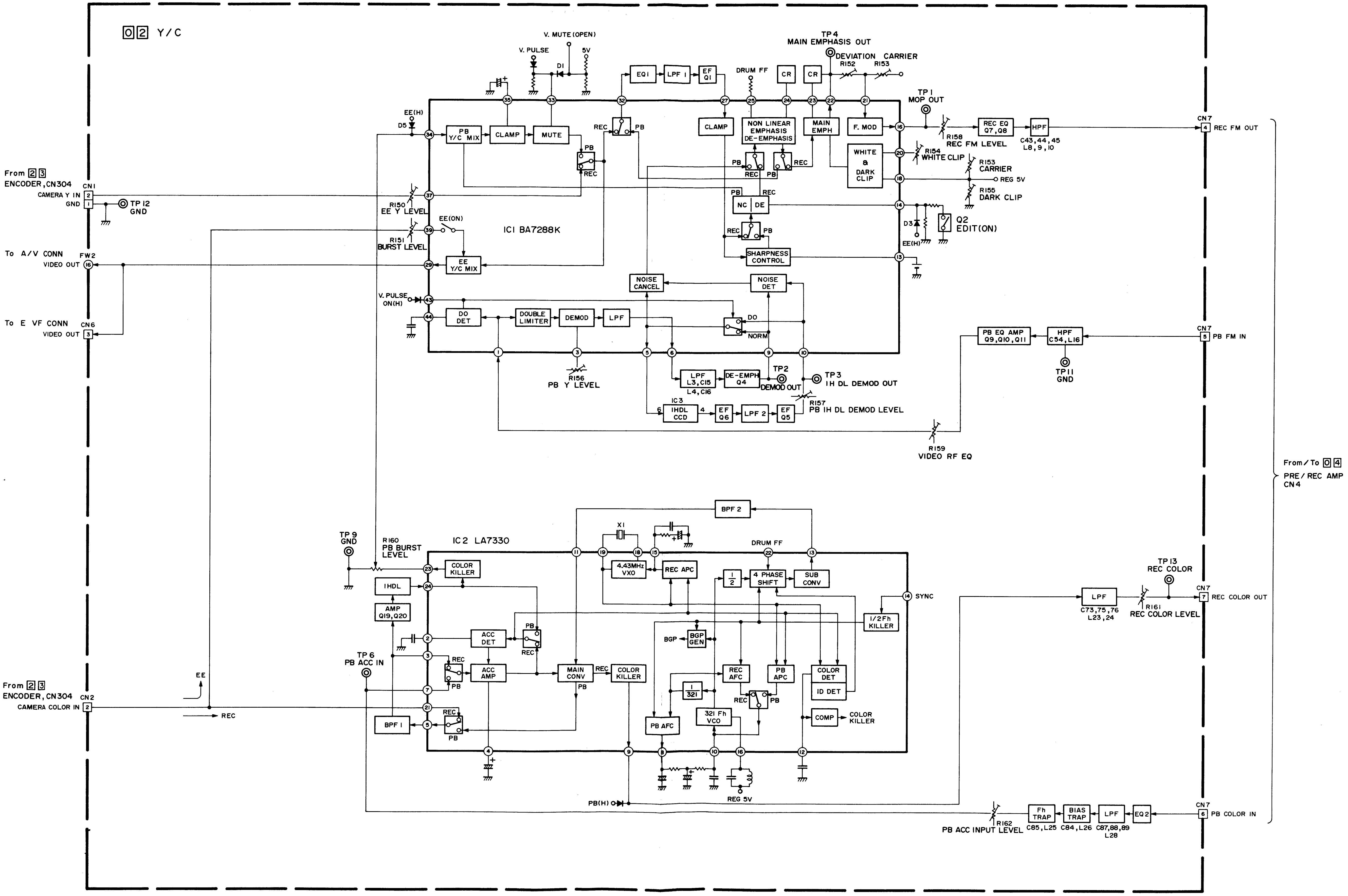
01 MAIN (AUDIO)
CN 7
FADER SIGNAL
(from IND-1)
26 MIC AMP
CN 702
CN 9
IC 701
MIC AMP
AUDIO FADER
IC 701
CN 701
05 MIC JACK
CN 1
EXT MIC JACK
MIC
ATT -12dB
R347
R301
R303
MIC IN
EE
PB
AUDIO EE(H)
REC MUTE (L)
REC
REC : ON
EE
PB
ATT -26dB
REC AMP
AUDIO EE(H)
Q302
Q303
Q310
Q313
REC EQ
LP : ON
IC 301
SP (L)
REC MUTE (H)
EE(H)/PB (L)
Q306, Q307
Q308, Q309
BIAS OSC SW
BIAS OSC
R342
BIAS LEVEL
BIAS MIX
CN10
AUDIO ERASE HEAD
CN10
AUDIO HEAD
CAM(H)/EXT(L) MG6
BIAS
PB
OFF
IC 302
2Fh TRAP
Fh TRAP
R309
PB AUDIO LEVEL
PB EQ AMP
SP : ON
LP : ON
EQ
fo Q
10
TP303
REC BIAS(+)
TP304
REC BIAS(−)
MUTE (H)
EF Q311
TP302
AUDIO OUT
CN1
CN15
02 Y/C
1K
220
220
A/V CONNECTOR
EARPHONE JACK
06 JACK

4.4 SERVO BLOCK DIAGRAM

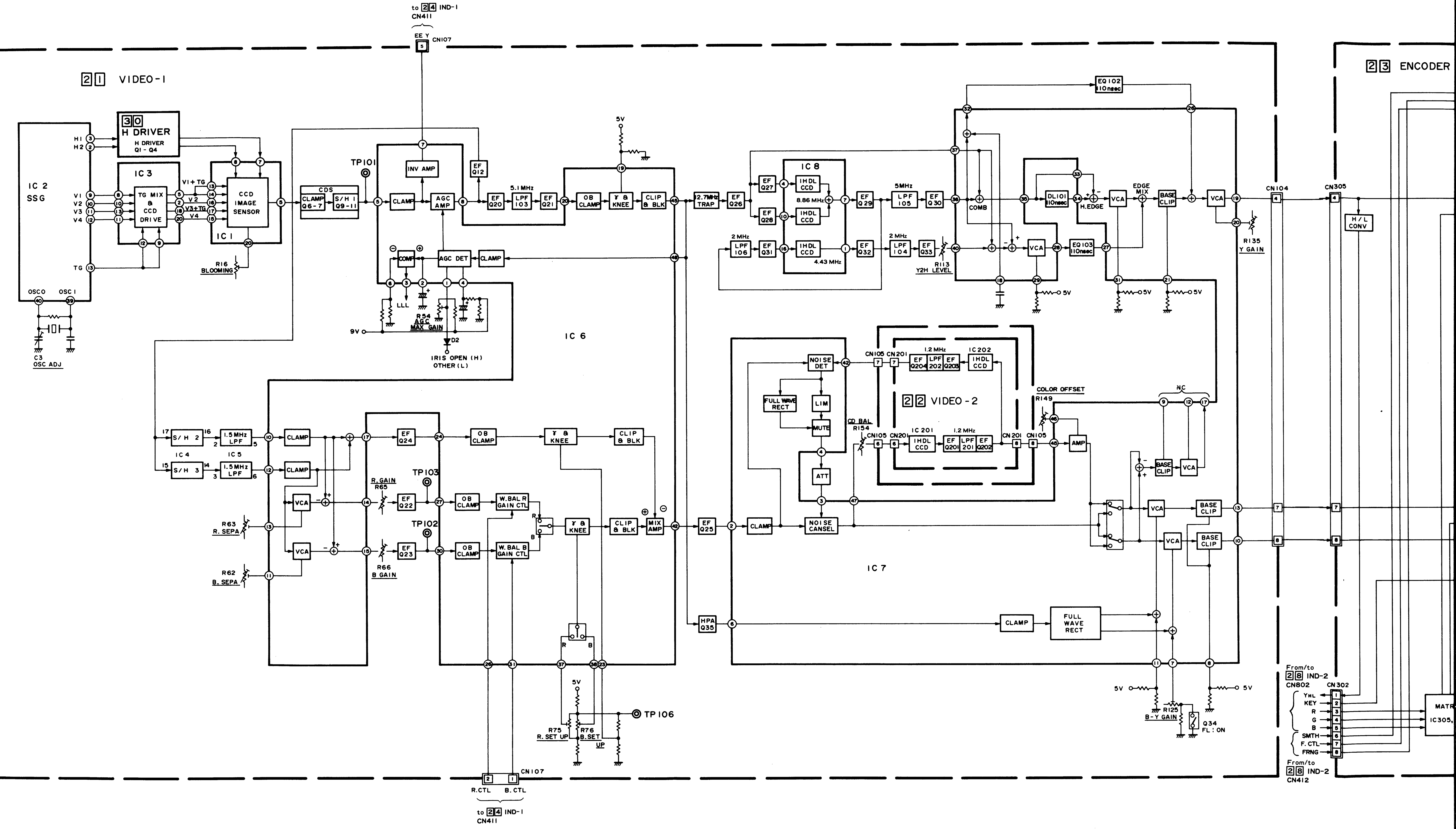


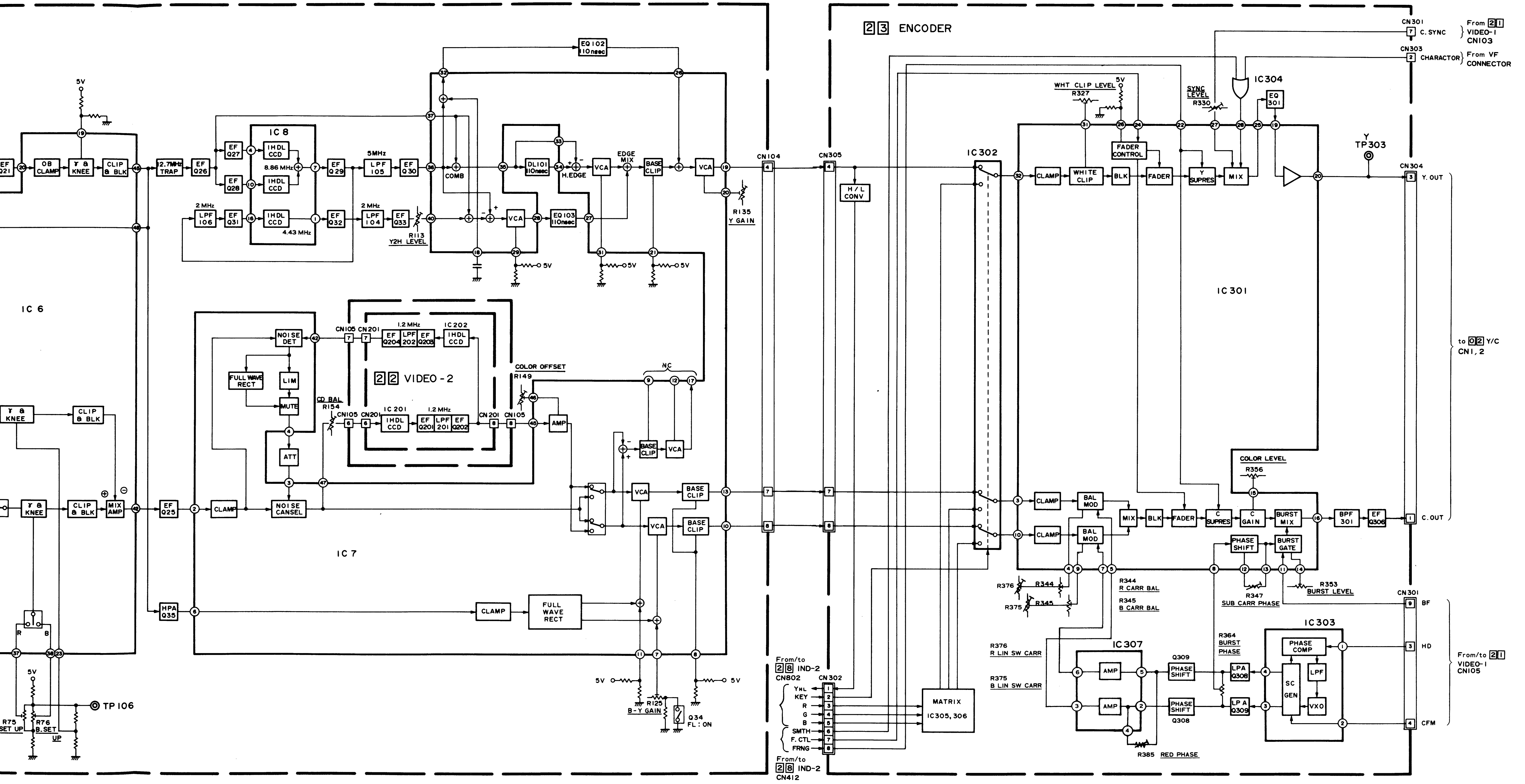
01 MAIN (SERVO)
03 DRUM MDA
IC 101
IC 102
HEAD SWITCHING PULSE GEN
1/3
DRUM FG COUNTER
PB SW MMV
OL 1 CNT
OL 2 CNT
25Hz
DRUM PHASE DET
DRUM F-V CONV
PULSE GEN
5V
R108
PB SW POINT
TP111
DRUM FF
CN 3
To 04 PRE/REC AMP CN3
D FF
SW A
SW B
SW C
SW D
Q107 – Q110
REC or PB : OFF
From/To 02 Y/C CN5
CN15
V. PULSE
C SYNC
SEARCH or STILL : ON
V. PULSE COUNTER
V. SYNC SEP
RESET
REC : ON
REFERENCE COUNTER
LP CTL DLY
TP106
IC105
THERMAL DELAY CONTROL
SP
LP
DELAY MMV
REC CTL COUNTER
Q115
DELAY
TRACKING MMV
PB
REC
CAPSTAN REF. COUNTER
PB CTL PULSE
TP108
IC103
CTL PULSE AMP
WAVEFORM SHAPER
CN10
CONTROL HEAD
FWD
REV
NORM
1/3
1/7
SEARCH
1/72
1/24
CAPSTAN PHASE DET
CAPSTAN FG
TP107
CAPSTAN FG AMP
CAPSTAN F.V CONV
SEARCH
SP‡SEARCH
NORM H
TEST L
TP110
TEST
R103
TRACKING PRESET
R101
TRACKING
LPF
R117, C109
LOOP FILTER
R147, C122
Q103
DC LIMITER
DRUM APC
TP105
R118
C110
VF
DRUM MIX AMP
DRUM START DET
TRAP 101
DRUM TRAP
Q104
DRUM POWER UP
DRUM ERROR
DRUM POWER
DC-DC CONVERTER
CAPSTAN POWER
CAPSTAN POWER UP
CAPSTAN REFERENCE
Q105
Q106
PAUSE : ON
R139, C117
CAP APC
TP104
R119
C111
R120
C112
CAPSTAN START DET
CAPSTAN GAIN CTL
CAPSTAN MIX AMP
CAP TRAP
CN4
CN251
IC 251
WAVEFORM SHAPER
DRUM FG AMP
CN252
DRUM FG
DRUM PG
HALL AMP & ROTATE CONTROL
DEF AMP
DRIVE AMP
ERROR DET
DRUM MOTOR
CN14
IC104
HALL AMP & ROTATE CONTROL
Q112 – Q114
MR HEAD
CAPSTAN FG
CAPSTAN MOTOR

4.5 Y/C BLOCK DIAGRAM


02 Y/C
V. MUTE (OPEN)
V. PULSE
5V
D1
TP4
MAIN EMPHASIS OUT
DEVIATION CARRIER
R152
R153
DRUM FF
EQ1
LPF 1
EF Q1
CR
CR
TP1
MOP OUT
EE(H)
D5
PB Y/C MIX
CLAMP
MUTE
REC
PB
CLAMP
NON LINEAR EMPHASIS DE-EMPHASIS
MAIN EMPH
F. MOD
R158
REC FM LEVEL
REC EQ Q7,Q8
HPF
C43,44,45 L8,9,10
CN7
REC FM OUT
WHITE & DARK CLIP
R154
WHITE CLIP
R153
CARRIER
REG 5V
R155
DARK CLIP
From 23 ENCODER,CN304
CN1
CAMERA Y IN
GND
TP12 GND
R150
EE Y LEVEL
EE(ON)
IC1 BA7288K
NC
DE
D3
Q2
EDIT(ON)
EE(H)
R151
BURST LEVEL
To A/V CONN
FW2
VIDEO OUT
EE Y/C MIX
SHARPNESS CONTROL
NOISE CANCEL
NOISE DET
V. PULSE ON(H)
DO DET
DOUBLE LIMITER
DEMOD
LPF
DO
NORM
To E VF CONN
CN6
VIDEO OUT
PB EQ AMP Q9,Q10,Q11
HPF C54,L16
PB FM IN
TP11 GND
R156
PB Y LEVEL
LPF L3,C15 L4,C16
DE-EMPH Q4
TP2
DEMOD OUT
TP3
1H DL DEMOD OUT
IC3
1HDL CCD
EF Q6
LPF 2
EF Q5
R157
PB 1H DL DEMOD LEVEL
R159
VIDEO RF EQ
From/To 04
PRE/REC AMP CN4
BPF 2
X1
DRUM FF
TP9 GND
R160
PB BURST LEVEL
IC2 LA7330
COLOR KILLER
4.43MHz VXO
REC APC
1/2
4 PHASE SHIFT
SUB CONV
1HDL
SYNC
1/2Fh KILLER
TP13
REC COLOR
LPF
C73,75,76 L23,24
R161
REC COLOR LEVEL
REC COLOR OUT
AMP Q19,Q20
ACC DET
BGP
BGP GEN
TP6
PB ACC IN
ACC AMP
MAIN CONV
COLOR KILLER
REC AFC
PB APC
COLOR DET
ID DET
1/321
From 23 ENCODER,CN304
CN2
CAMERA COLOR IN
EE
REC
BPF 1
PB AFC
321 Fh VCO
COMP
COLOR KILLER
REG 5V
PB(H)
R162
PB ACC INPUT LEVEL
Fh TRAP
C85,L25
BIAS TRAP
C84,L26
LPF
C87,88,89 L28
EQ2
PB COLOR IN

4.6 VIDEO BLOCK DIAGRAM


to 24 IND-1
CN411
EE Y
CN107
21 VIDEO-1
23 ENCODER
30 H DRIVER
H DRIVER
Q1 - Q4
IC 2
SSG
H1
H2
V1
V2
V3
V4
TG
OSCO
OSC I
C3
OSC ADJ
IC 3
TG MIX & CCD DRIVE
V1+TG
V2
V3+TG
V4
CCD IMAGE SENSOR
IC 1
R16
BLOOMING
CDS
CLAMP Q6-7
S/H 1 Q9-11
TP101
CLAMP
INV AMP
AGC AMP
EF Q12
AGC DET
CLAMP
COMP
LLL
R54
AGC
MAX GAIN
9V
D2
IRIS OPEN (H)
OTHER (L)
IC 6
5.1 MHz
EF Q20
LPF 103
EF Q21
OB CLAMP
γ & KNEE
CLIP & BLK
5V
12.7MHz TRAP
EF Q26
EF Q27
EF Q28
IC 8
1HDL CCD
8.86 MHz
4.43 MHz
2 MHz
LPF 106
EF Q31
EF Q32
5MHz
EF Q29
LPF 105
EF Q30
2 MHz
LPF 104
EF Q33
R113
Y2H LEVEL
EQ 102
110nsec
COMB
DL101
110nsec
H.EDGE
VCA
EDGE MIX
BASE CLIP
EQ 103
110nsec
5V
R135
Y GAIN
CN104
CN305
H/L CONV
S/H 2
S/H 3
IC 4
IC 5
1.5MHz LPF
CLAMP
VCA
R63
R. SEPA
R62
B. SEPA
EF Q24
R. GAIN
R65
TP103
EF Q22
TP102
EF Q23
R66
B GAIN
OB CLAMP
W. BAL R GAIN CTL
W. BAL B GAIN CTL
γ & KNEE
CLIP & BLK
MIX AMP
R
B
5V
R75
R. SET UP
R76
B. SET UP
TP106
CN107
R.CTL
B.CTL
to 24 IND-1
CN411
EF Q25
HPA Q35
CLAMP
NOISE DET
FULL WAVE RECT
LIM
MUTE
ATT
NOISE CANSEL
CD BAL
R154
CN105
CN201
1.2 MHz
EF Q204
LPF 202
EF Q203
IC202
1HDL CCD
22 VIDEO - 2
IC 201
1HDL CCD
EF Q201
LPF 201
EF Q202
COLOR OFFSET
R149
NC
AMP
BASE CLIP
VCA
IC 7
CLAMP
FULL WAVE RECT
5V
R125
B-Y GAIN
Q34
FL: ON
From/to
28 IND-2
CN802
CN302
YNL
KEY
R
G
B
SMTH
F. CTL
FRNG
From/to
28 IND-2
CN412
MATR
IC305,

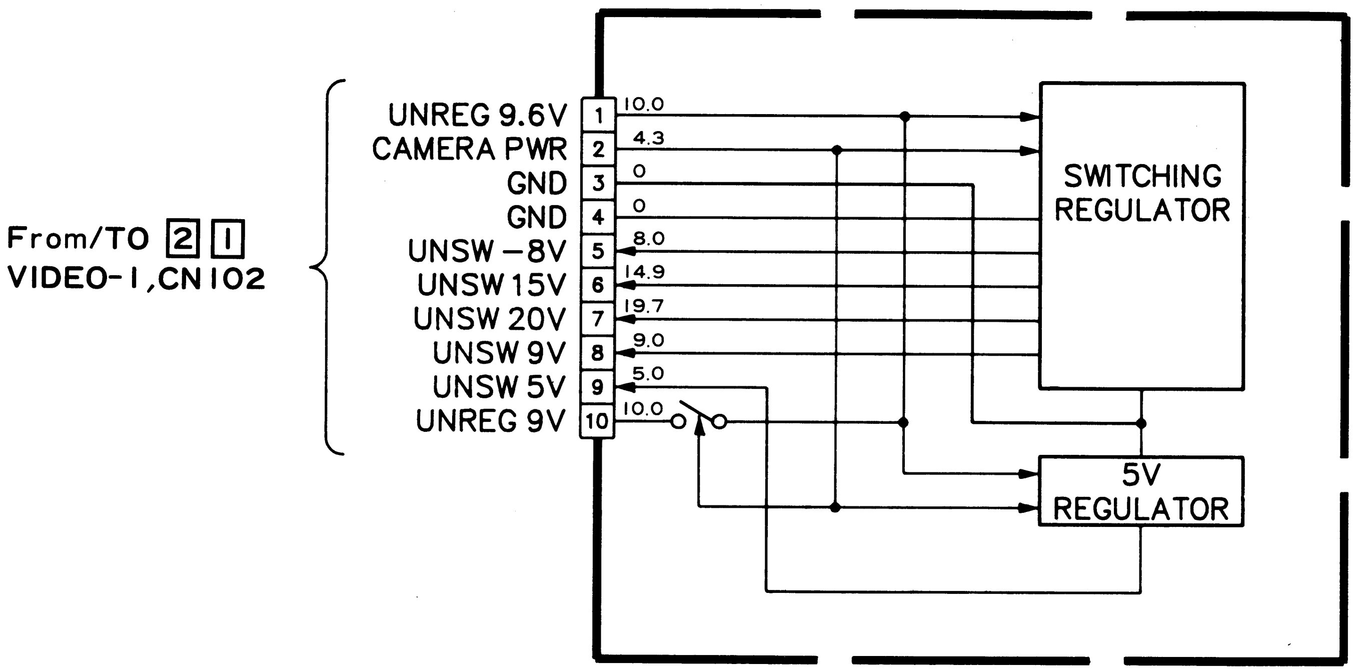


2 3 ENCODER
2 2 VIDEO-2
IC 6
IC 7
IC 8
IC 301
IC 302
IC 303
IC 304
IC 307
IC 201
IC 202
5V
OB CLAMP
γ & KNEE
CLIP & BLK
12.7MHz TRAP
EF Q26
EF Q27
EF Q28
IHDL CCD
8.86 MHz
4.43 MHz
EF Q29
5MHz
LPF 105
EF Q30
COMB
2 MHz
LPF 106
EF Q31
EF Q32
LPF 104
EF Q33
R113 Y2H LEVEL
EQ 102 110nsec
EQ 103 110nsec
DL101 110nsec
H.EDGE
VCA
EDGE MIX
BASE CLIP
R135 Y GAIN
CN104
CN305
H/L CONV
NOISE DET
FULL WAVE RECT
LIM
MUTE
ATT
CD BAL R154
CN105
CN201
1.2 MHz
EF Q204
LPF 202
EF Q203
EF Q201
LPF 201
EF Q202
COLOR OFFSET R149
NC
AMP
MIX AMP
EF Q25
CLAMP
NOISE CANSEL
HPA Q35
FULL WAVE RECT
R125 B-Y GAIN
Q34 FL : ON
R
B
TP 106
R75 SET UP
R76 B.SET UP
From/to 2 8 IND-2 CN802
CN302
YHL
KEY
R
G
B
SMTH
F. CTL
FRNG
From/to 2 8 IND-2 CN412
MATRIX IC305, 306
CN301
7 C. SYNC
From 2 1 VIDEO-1 CN103
CN303
2 CHARACTOR
From VF CONNECTOR
WHT CLIP LEVEL R327
SYNC LEVEL R330
EQ 301
FADER CONTROL
WHITE CLIP
BLK
FADER
Y SUPRES
MIX
Y TP303
CN304
3 Y. OUT
to 0 2 Y/C CN1, 2
COLOR LEVEL R356
BAL MOD
C SUPRES
C GAIN
BURST MIX
BPF 301
EF Q306
1 C. OUT
PHASE SHIFT
BURST GATE
R376
R344
R375
R345
R344 R CARR BAL
R345 B CARR BAL
R347 SUB CARR PHASE
R353 BURST LEVEL
9 BF
3 HD
4 CFM
From/to 2 1 VIDEO-1 CN105
R376 R LIN SW CARR
R375 B LIN SW CARR
R364 BURST PHASE
Q309
Q308
PHASE SHIFT
LPA Q306
LPA Q309
PHASE COMP
SC GEN
LPF
VXO
R385 RED PHASE

4.7 DC-DC CONVERTER BLOCK DIAGRAM

Note:

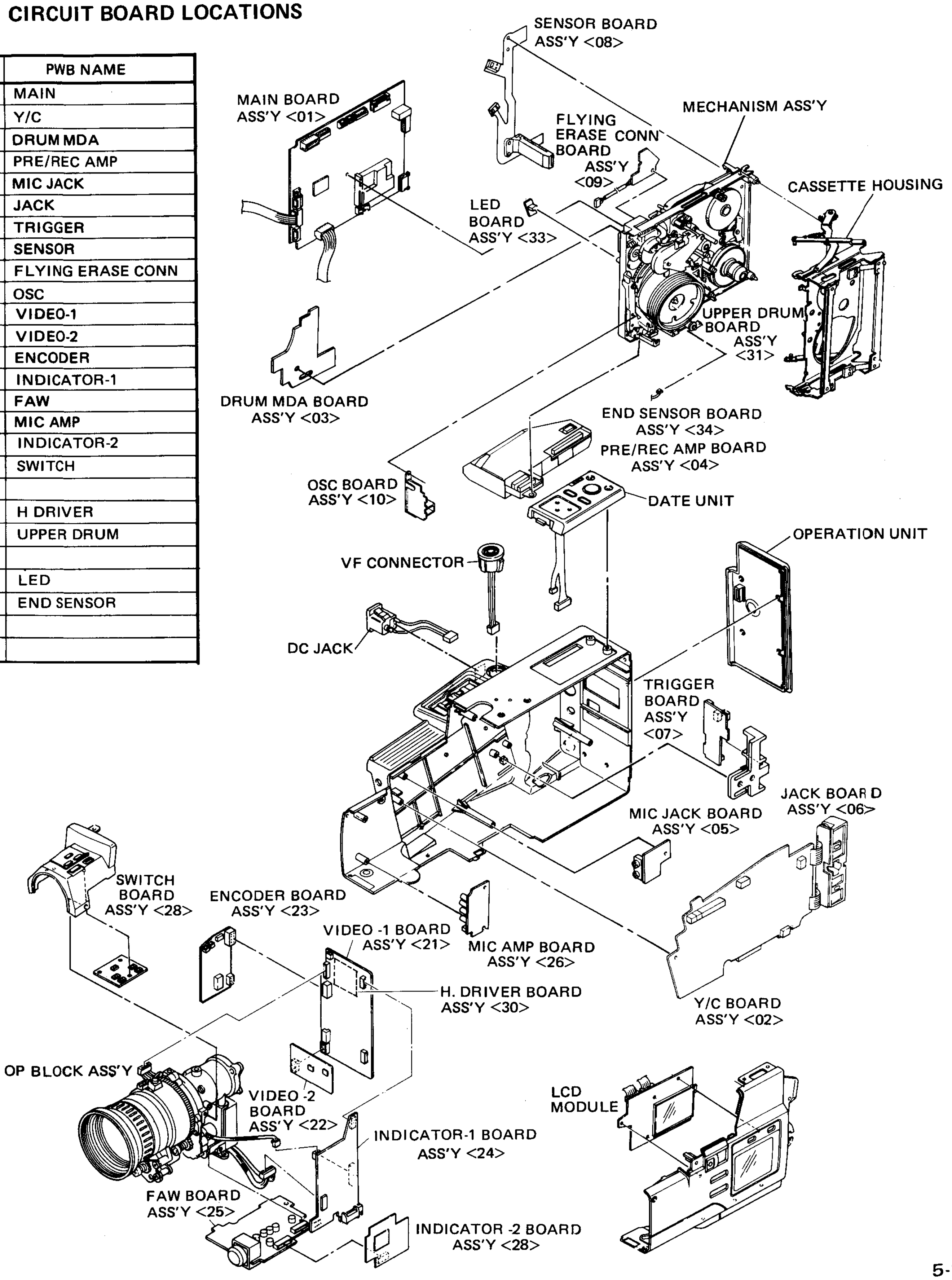
This block diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.


From/TO 2 1
VIDEO-1,CN102
UNREG 9.6V
CAMERA PWR
GND
GND
UNSW −8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
UNREG 9V
1
2
3
4
5
6
7
8
9
10
10.0
4.3
0
0
8.0
14.9
19.7
9.0
5.0
10.0
SWITCHING
REGULATOR
5V
REGULATOR

SECTION 5
DIAGRAMS AND CIRCUIT BOARDS

5.1 CIRCUIT BOARD LOCATIONS

No.	PWB NAME
01	MAIN
02	Y/C
03	DRUM MDA
04	PRE/REC AMP
05	MIC JACK
06	JACK
07	TRIGGER
08	SENSOR
09	FLYING ERASE CONN
10	OSC
21	VIDEO-1
22	VIDEO-2
23	ENCODER
24	INDICATOR-1
25	FAW
26	MIC AMP
28	INDICATOR-2
28	SWITCH
30	H DRIVER
31	UPPER DRUM
33	LED
34	END SENSOR

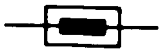

SENSOR BOARD ASS'Y <08>
MAIN BOARD ASS'Y <01>
FLYING ERASE CONN BOARD ASS'Y <09>
MECHANISM ASS'Y
CASSETTE HOUSING
LED BOARD ASS'Y <33>
UPPER DRUM BOARD ASS'Y <31>
DRUM MDA BOARD ASS'Y <03>
END SENSOR BOARD ASS'Y <34>
PRE/REC AMP BOARD ASS'Y <04>
OSC BOARD ASS'Y <10>
DATE UNIT
OPERATION UNIT
VF CONNECTOR
DC JACK
TRIGGER BOARD ASS'Y <07>
JACK BOAR D ASS'Y <06>
MIC JACK BOARD ASS'Y <05>
SWITCH BOARD ASS'Y <28>
ENCODER BOARD ASS'Y <23>
VIDEO -1 BOARD ASS'Y <21>
MIC AMP BOARD ASS'Y <26>
H. DRIVER BOARD ASS'Y <30>
Y/C BOARD ASS'Y <02>
OP BLOCK ASS'Y
VIDEO -2 BOARD ASS'Y <22>
LCD MODULE
INDICATOR-1 BOARD ASS'Y <24>
FAW BOARD ASS'Y <25>
INDICATOR -2 BOARD ASS'Y <28>

5.2 SCHEMATIC DIAGRAM NOTES

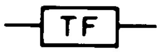
1. ▨ parts are safety related parts. When replacing them, be sure to use the specified parts.
2. Unit indications

No units:[Ω]	No units:[μF]	No units:[μH]
K:[kΩ]	P:[pF]	m:[mH]
M:[MΩ]		

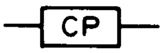
Thermistor



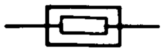
Thermal Fuse

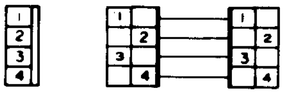


Circuit Protector

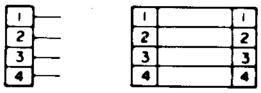


Posistor

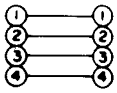




: Connector



: Board in connector

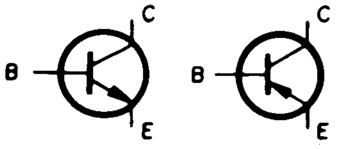


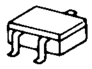
: Direct connection

COUNT UP : Active only at high.
$\overline{\text{COUNT DOWN}}$: Active only at low.

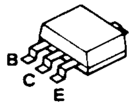
VS : Connected pattern in the board.
MS Abbreviations
SM V : Video M : Mechacon
S : Servo A : Audio
VS : Signal flow from video to servo.

3. Chip transistor

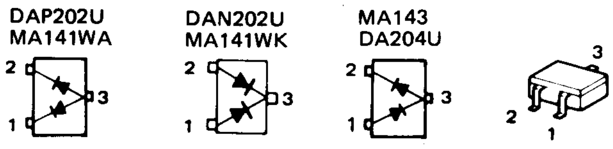




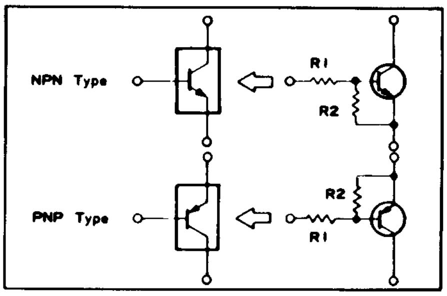
(Standard type)



4. Chip diode


DAP202U
MA141WA
2
1
3
DAN202U
MA141WK
2
1
3
MA143
DA204U
2
1
3
3
2
1

5. Digital transistor


NPN Type
R1
R2
PNP Type
R2
R1

RESISTOR VALUES

JUNCTION	Part No.	R1 (kΩ)	R2 (kΩ)
PNP	DTA124EU	22	22
NPN	DTC144EU	47	47
	DTC124EU	22	22

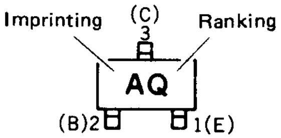
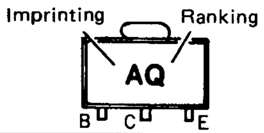
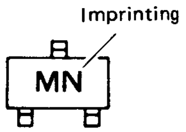
Note: The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.
USES: INVERTER, INTERFACE, DRIVER CIRCUITS.

6. Definition of the surface and the back of circuit board diagrams
Front : Side on which discrete parts are assembled
Rear : Side on which chip parts are assembled

5.3 REPLACING SUBMINIATURE "CHIP" PARTS

1. Some resistors, shorting jumpers (0 Ω resistance), ceramic capacitors, transistors, and diodes are chip parts. These chip parts cannot be reused after they are once removed.
2. Additional compactness is achieved by using subminiature chip parts for certain circuit elements. When replacing these parts, note the cautions outlined below.
3. Chip transistors and diodes used in this model are outlined bellow.
4 Refer to parts list for correct part numbers.

- **Chip transistor and chip diode imprinting**

Transistors				Diodes	
Type	Imprinting	Type	Imprinting	Type	Imprinting
DTA124EU	15	2SB798	DM, DL, DK	DAN202U	N
DTA144EU	16	2SC2412K(S)	BS	DAP202K	P
DTC124EU	25	2SC3931	UB~UD	DAP202U	P
DTC124XU	45	2SC3936(BC)	KB, KC	DA204U	K
DTC144EU	26	2SC4081	BQ~BS	FMN1	N1
FMC2	C2	2SC4097(QR)	CQ, CR	IMN10	N10
FMG1	G1	2SC4098(PQ)	AP, AQ	MA141WA	MN
FMG2	G2	2SC4099(NP)	JN, JP	MA141WK	MT
FMQ1	Q1	2SC4176	B33, B34, B35	MA143	MC
FMS2	S2	2SC4177(56)	L5, L6	MA3075H	7.5H
FMU1	U1	2SC4178(34)	F13, F14	MA704	MIK
FMW1	W1	2SC4181	L17, L18	MA714	MIP
FMW3	W3	2SD1819	YR~YS	MA716	M1U
FMY1	Y1	2SJ146	4D	RB451F	3C
2SA1036K(QR)	HQ ~ HR	2SK198P,Q	10P, 10Q	RD7.5M-T1B2	752
2SA1532(BC)	EB, EC	2SK620	3N	RD7.5M-T2B2	752
2SA1576	FQ ~ FS	2SK665	30	RLZ5.6B	753
2SA1577	HQ ~ HS	3SK179	V03	RLZ8.2B	82$\underline{2}$
2SA1610	Y33, Y34			RD7.5MB3	125
2SA1611(56)	M5, M6			RD8.2MB2	165
2SB1218(RS)	AR, AS				
2SB624	BV4				
					

5.4 KEY TO ABBREVIATIONS

A	AC	: Alternating Current
	ACC	: Automatic Color Control
	A/CTL	: Audio/Control
	ADC	: Analog to Digital Converter
	ADD	: Adder
	ADJ	: Adjustment
	AE	: Audio Erase
	AEF	: Automatic Editing Function
	AF	**: Auto Focus**
	AFC	: Automatic Frequency Control
	AFT	: Automatic Fine Tuning
	AGC	: Automatic Gain Control
	AH	: Audio Head
	AL	**: After Loading, Allways**
	ALC	: Automatic Light Compensation Automatic Level Control
	ALM	: Alarm
	ALU	: Arithmetic Logic Unit
	AM	: Amplitude Modulation
	AMP	: Amplifier
	ANT	: Antenna
	APC	: Automatic Pedestal Control Automatic Phase Control
	APL	: Average Picture Level
	A/S/M	: Audio/Servo/Mechacon
	ASS'Y	: Assembly
	ATT	: Attenuator
	AUD	: Audio
	AUTO	: Automatic
	AUX	: Auxiliary

B	B	**: Base, Blue**
	BAL	: Balance
	BATT	: Battery
	BBD	: Bucket Brigade Device
	BCD	: Binary Coded Decimal
	BEG	: Beginning
	BF	**: Behind Focus**
	BFP	: Burst Flag Pulse
	BPF	**: Band Pass Filter**
	BIT	: Binary Digit
	BLK	: Black, Blanking
	BLU	: Blue
	BNC	: Bayonet Connector
	BOT	: Beginning of Tape
	BPF	: Bandpass Filter
	BRK	: Brake
	BRN	: Brown
	BRT	: Brightness
	BT	: Band Tuning
	BUFF	: Buffer
	BW or B/W	: Black and White

C	C	**: Capacitance, Collector, Color, Character**
	CA	**: Camera**
	CAL	: Calibration
	CAP	: Capstan, Capacitor
	CAR	: Carrier
	CARR	: Carrier
	CASS	: Cassette
	CC	: Cassette Compartment
	CCD	: Charge Coupled Device
	CCT	: Circuit
	CdS	: Cadmium Sulphide
	CD	: Count Down
	CE	: Chip Enable
	CF	**: Ceramic Filter, Color Frame, Correct Focus**
	CH	: Channel
	CHG	: Charge
	CHROMA	: Chrominance
	CLK	: Clock
	CLR	: Clear
	CMD	: Command
	CMOS	: Complementary Metal Oxide Semiconductor
	CNT	: Count, Counter
	COL	: Color
	COM	: Common
	COMB	: Combination Comb Filter
	COMP	: Comparator Composite Compensation
	CONN	: Connector
	CONV	: Converter
	CP	: Circuit Protector Clamp Pulse
	CPC	: Capstan Phase Control
	CPU	: Central Processing Unit
	CTC	: Crosstalk Cancel
	CTL	: Control

D	D	: Drum, Digital, Diode, Drain
	DAC	: Digital to Analog Converter
	dB	: Decibel
	DC	: Direct Current
	DD	: Direct Drive
	DEC	: Decoder
	DEMOD	: Demodulator
	DEMUX	: Demultiplexer
	DET	: Detector
	DEV	: Deviation
	DFRS	: Drum Free Running Stop
	DG	: Differential Gain
	DIF	: Differential
	DISCR	: Discriminator
	DL	: Delay Line
	DOC	: Dropout Compensator
	DOD	: Drop Out Detector
	DP	: Differential Phase
	DPC	: Drum Phase Control
	DYAC	: Dynamic Aperture Control

E	E	: Edit, Emitter
	EDP	: Electronic Data Processing
	E-E	: Electric to Electric
	EF	: Emitter-Follower
	EMP	: Emphasis
	EN	: Enable
	ENC	: Encoder
	ENV	: Envelope
	EOT	: End of Tape
	EP	: Extended Play
	EQ	: Equalizer
	ES	: Electronic Switch
	ESNS	: End Sensor
	EXP	: Expander
	EXT	: External

F	F	: Farad, Fuse
	F ADV	: Frame Advance
	FDP	: Fluorescent Display Panel
	FE	: Full Erase
	FET	: Field Effect Transistor
	FF	**: Fast Forward, Front Focus** Flipflop
	FG	: Frequency Generator
	FM	: Frequency Modulation
	FR	: Full Recording, Frame, Fusible Resistor
	FREQ	: Frequency
	F-V CONV	: Frequency to Voltage Converter
	FWD	: Forward
	FWD S	: Forward Search

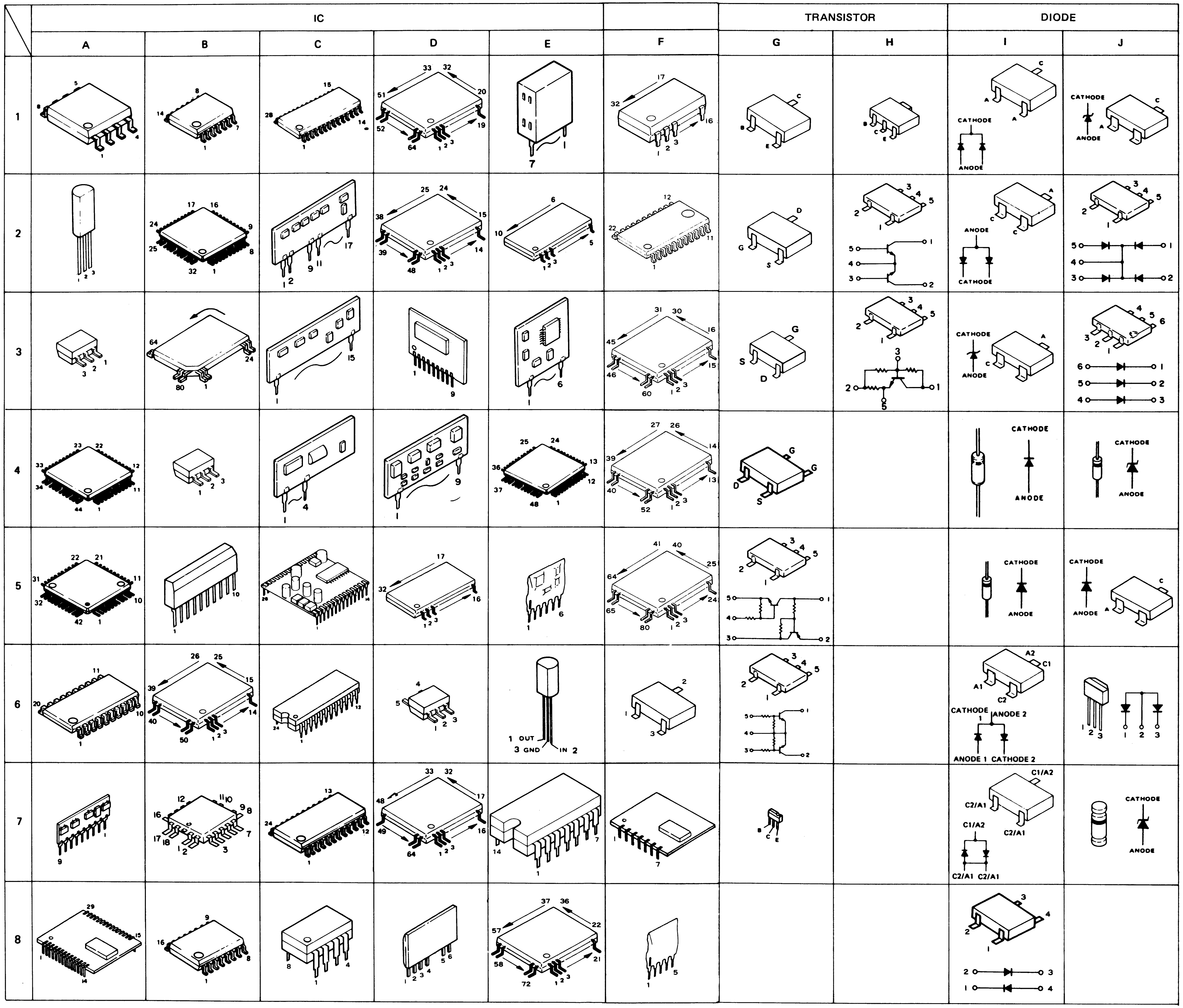
G	G	: Green, Gate, Grid
	GEN	: Generator
	GND	: Ground
	GRN	: Green
	GRY	: Gray

H	H	: High, Henry, Hour
	HBF	: Horizontal Burst Flag
	HD	: Horizontal Drive
	HPF	: Highpass Filter
	Hz	: Herz

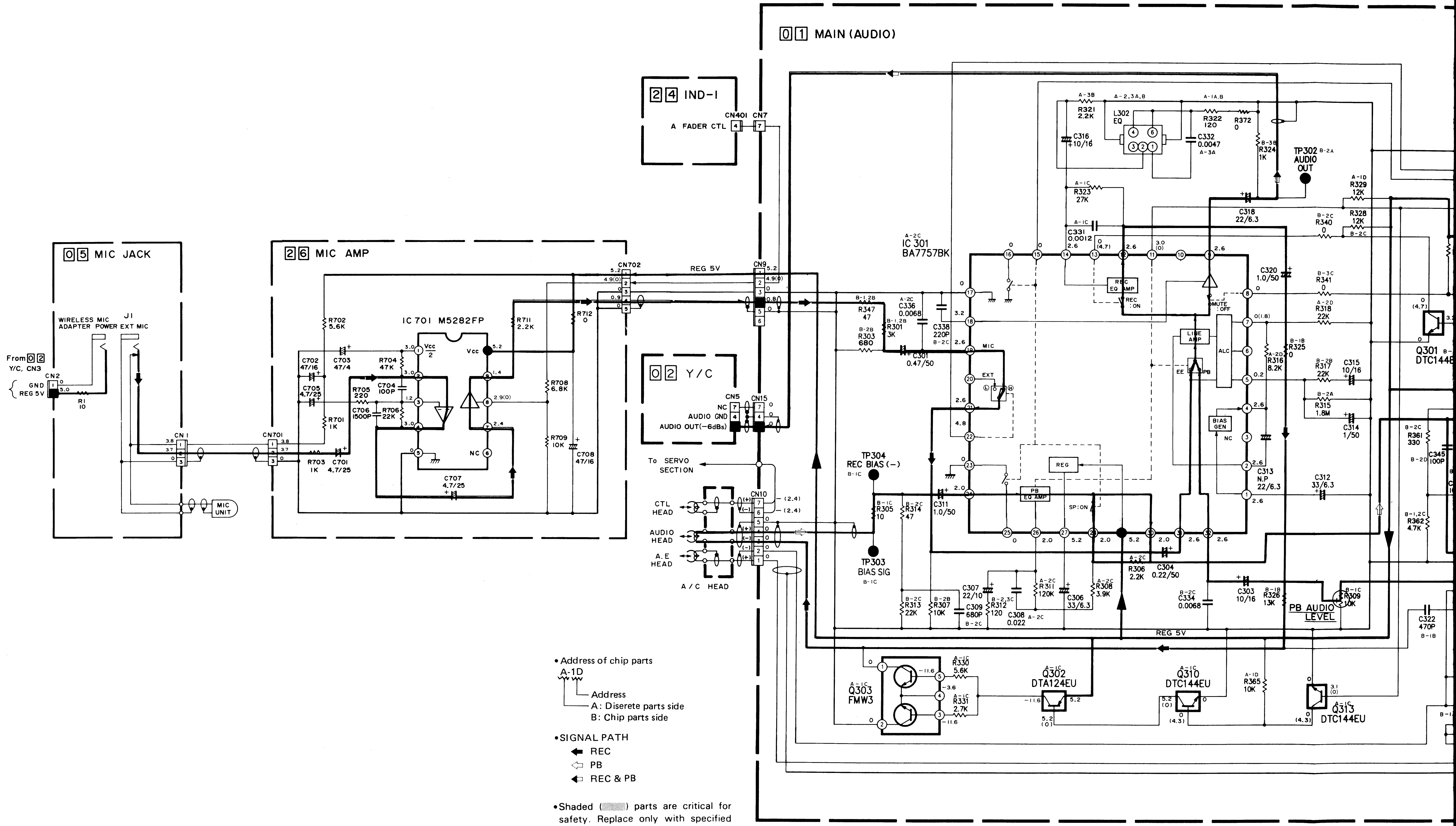
I	IC	Integrated Circuit
	ID	Identification (Pulse)
	IF	Intermediate Frequency
	IFR	Infrared
	IFT	Intermediate Frequency Transformer
	IND	Indicator
	INH	Inhibit
	INS	Insert
	INT	Internal, Interrupt
	INV	**Inverter, Interleave**
	I/O	Input/Output
	IR	Infrared
L	L	Low, Left
	LCD	Liquid Crystal Display
	LED	Light Emitting Diode
	LIM	Limiter
	LIN	Linearity
	LLD	Low Light Detector
	LOAD	Loading (Cassette)
	LP	Long Play
	LPF	Lowpass Filter
	LSB	Lower Sideband
M	M	Motor, Mega
	MAX	Maximum
	MDA	Motor Drive Amplifier
	MECHACON	Mechanism Control
	MIC	Microphone
	MIN	Minimum
	MIX	Mixer, Mixing
	MMV	Monostable Multivibrator
	MNOS	Metal Nitride Oxide Semiconductor
	MOD	Modulation, Modulator
	MODEM	Modulator-Demodulator
	MON	Monitor
	MOS	Metal Oxide Semiconductor
	MPX	Multiplexer, Multiplex
	MS	Mode Select
	MUT	Muting
N	NAND	Not-And
	NC	Not Connected, Normally Closed
	NFB	Negative Feedback
	NLN	Non-Linear
	NO	Normally Open
	NOR	Normal, Not-Or
	NR	Noise Reduction
O	OP	Operation
	OPAMP	Operational Amplifier
	ORG	Orange
	OSC	Oscillator
P	PB	Playback
	PC	Photocoupler, Pulse Counter
	PCM	Pulse Code Modulation
	PG	Pulse Generator
	PGM	Program
	PI	Photo Interrupter
	PIC	Picture Control
	PIF	Picture Intermediate Frequency
	PLA	Programmable Logic Array
	PLL	Phase Locked Loop
	PNK	Pink
	POS	Position
	p-p	Peak-to-Peak
	PR	Pinch Roller
	PREAMP	Preamplifier
	PRL	Preroll
	P/S	Pause/Still
	PSC	Pulse Swallowing Control
	PU	Pickup
	PUT	Programmable Unijunction Transistor
	PWB	Printed Wiring Board
	PWM	Pulse Width Modulation
	PWR	Power
Q	Q	Quality Factor
R	R	Red, Right
	RA	Resistor Array
	RAM	Random Access Memory
	REC	Recording
	REF	Reference
	REG	Regulated, Regulator
	REM	Remote
	REMOCON	Remote Control (Unit)
	REV	Reverse
	REV S	Reverse Search
	REW	Rewind
	RF	Radio Frequency
	ROM	Read Only Memory
	R/P	Record/Playback
	RPT	Repeat
	RS FF	RS Flipflop
	RST	Reset
	RT	Rotary Transformer
	RUN	Running
	RY	Relay
S	SAW	Sawtooth, Surface Acoustic Wave
	SC	Subcarrier, Simulcast
	SCH	Search
	SEL	Select, Selector
	SENS	Sensor
	SEP	Separator
	SF	Source Follower
	SFF	Short Fast Forward
	SIF	Sound Intermediate Frequency
	SN	Signal to Noise Ratio
	SOL	Solenoid
	SOS	Sound on Sound
	SP	Standard Play
	SR	Supply Reel
	SREW	Short Rewind
	S/S	Slow/Still
	SSG	Sync Signal Generator
	SSNS	Start Sensor
	STD	Strobe Data, Standard
	SUP	Supply
	SW	Switch
	SWD	Switched
	SYNC	Synchronization
T	TAL	Tally
	TBC	Time Base Corrector
	TC	Tension Control, Time Code
	TEN	Tension
	TF	Thermal Fuse
	TIM	Timing
	TK	Tracking
	TNR	Tuner
	TP	Test Point
	TPZD	Trapezoid
	TR	Transistor, Trimmer
	TRANS	Transformer
	TU	Take-up
U	UL	Unloading
	UNREG	Unregulated
	UNSW	Unswitched
V	V	Vertical, Volt
	VACT	Video Action
	VCO	Voltage Controlled Oscillator
	VD	Vertical Drive
	VIF	Video Intermediate Frequency
	VLT	Violet
	VR	Variable Resistor
	VS	Video and Sync
	VSCH	Variable Search
	VV	Video to Video
	VXO	Variable Crystal Oscillator
W	W	Watt
	WARN	Warning
	W & D	White and Dark
	WHT	White
	WV	Working Voltage
X	XTAL	Crystal
Y	Y	Luminance
	YEL	Yellow

5.5 SEMICONDUCTOR SHAPES

NAME		L
	IC	
A	AFZ72F45A1	8D
	AFZ74A001X1	7A
	AFZ74A002X1	7A
	AN2275S	5D
	AN2276S	5D
	AN2512S	1B
	AN3212S	1C
	AN3323S	1C
	AN3592S	2F
	AN6308S	1A
	AN78L05	6E
	AN8009	6E
B	BA10324F	1B
	BA226F	1A
	BA6452F	7C
	BA6993F	1A
	BA7131F	1A
	BA7258AK	4A
	BA7288K	4A
	BA7600K	4A
	BA7601K	4A
	BA7606F	8B
	BA7751AF	7C
	BA7757BK	2B
	BA7757K	2B
	BU3721K	4A
	BU3767K	4A
	BU4011BF	1B
	BU4584BF	1B
C	CP1088G	1D
	CP1089G	1D
H	HD6305Z0F-CV05	3B
	H8B7101	1F
	H8D7046	4C
	H8D7047	3C
	H8D7048	2C
	H8D7051A	8A
	H8D7091A	5E
	H8D7091B	3E
	H8D7098	3C
	H8D7102	3E
	H8D7103	3E
I	IR3702N1	1B
L	LA7213	4D
	LA7316	7C
	LA7330	6C
M	MB671458	3B
	MC8089A	3D
	MC8180B	1E
	MC8181D	1E
	MC8182D	1E
	MN12821(QR)	6F
	MN3106S	1A
	MSM6829MS	1A
	MSM6830	6A
	MSM6831MS	6A
	MSM6846MS	1A
	MSM6847MS	1A
	MSM6855MS	6A
	MSM6967MS	1A
	MSM6964-3MS-WK	1A
	MSM6965-3MS	1A
	MSM6984MS	1A
	MSM6985MS	1A
	MSM69852MS	1A
	MSM6989MS	1A
	M37412M4-004FP	8E
	M50966-150FP	8E
	M51282FP	4E
	M51499FD	4E
	M51646FP	1C
	M51648FP	6B
	M51798FP	5A
	M51799FP	5A
	M52074FP	3F
	M5236ML	3A
	M52410FP	6A
	M52434FP	5A
	M5282FP	1A
	M54543ASL	5B
	M54543ASL-A	5B
	M54641FP	2E
	M5M5256FP	1C
N	NJM2233AM	1A
	NJM2244M	1A
	NJM2245M	1A
	NJM2246M	1A
	NJM2904E	1A
	NJM4560M	8C
S	S-81250AG	2A
	S-81252HG	2A
	S8054HN	4B
T	TC4S69F	6D
	TC4S71F	6D
	TC4S81F	6D
	TC7S32F	6D
	TC74HC32AF	1B
	THE175A	4D
	THE191A	5C
	THE245	8A
	THE257A	8F
	THE326A	7F
	TME336	4C
U	UPC2370GH	2D
	UPC2371GH	2D
	UPC324G2	1B
	UPD4013BG	7E
	UPD4538BG	8B
	UPD6147G	6A
	UPD6148GS	7C
	UPD9319CGC	4F
V	VC2031MP	7B
	VC2038	4E
	VC2039	7D
	VC2041	7C
	VC2043	7D
	VC2044	7D
	VC2073	7D
	VC2079B	5B
	VC2081	3B
	VC2085	5F
	VC2089	8E
	VC2091	7D
	VC2092	7D
	VC5026G	6A
	28VT03	5C
	6VT07	3E
	6VT08	3E
	TRANSISTOR	
D	DTA124EU	1G
	DTA144EU	1G
	DTC124EU	1G
	DTC124XU	1G
	DTC144EK	1G
	DTC144ES	7G
	DTC144EU	1G
	DTC144WK	1G
	DTC144WU	1G
F	FMC2	5G
	FMG1	6G
	FMG2	6G
	FMQ1	6G
	FMS2	2H
	FMU1	3H
	FMW1	2H
	FMW3	2H
	FMY1	2H
2SA	2SA1036K	1G
	2SA1532	1G
	2SA1576	1G
	2SA1577	1G
	2SA1610	1G
	2SA1611	1G
	2SA881R	7G
2SB	2SB1009	7G
	2SB1218	1G
	2SB624	1G
	2SB798	1H
2SC	2SC2412K	1G
	2SC3931	1G
	2SC3936	1G
	2SC4081	1G
	2SC4097	1G
	2SC4098	1G
	2SC4099	1G
	2SC4181	1G
	2SC4176	1G
	2SC4177	1G
	2SC4178	1G
2SD	2SD1819	1G
2SJ	2SJ146	2G
2SK	2SK198	3G
	2SK198P,G	3G
	2SK620	2G
	2SK665	2G
3SK	3SK179	4G
	DIODE	
D	DAN202U	1I
	DAP202K	2I
	DAP202U	2I
	DAP209S	6J
	DA204U	6I
E	ERA81-004	4I
F	FMN1	2J
I	IMN10	3J
M	MA141K	5J
	MA141WA	2I
	MA141WK	1I
	MA143	6I
	MA184	5I
	MA185	5I
	MA3075H	1J
	MA704	5I
	MA714	8I
	MA716	7I
R	RB451F	1I
	RD5.6EB2	4J
	RD6.8EB1	4J
	RD6.8EB2	4J
	RD7.5M	1J
	RD7.5M-T1B2	1J
	RD7.5M-T2B2	1J
	RD7.5MB3	1J
	RD8.2EB2	4J
	RD8.2EBS	4J
	RD8.2MB2	1J
	RLZ5.6B	7J
	RLZ8.2B	7J
	1SS133	5I

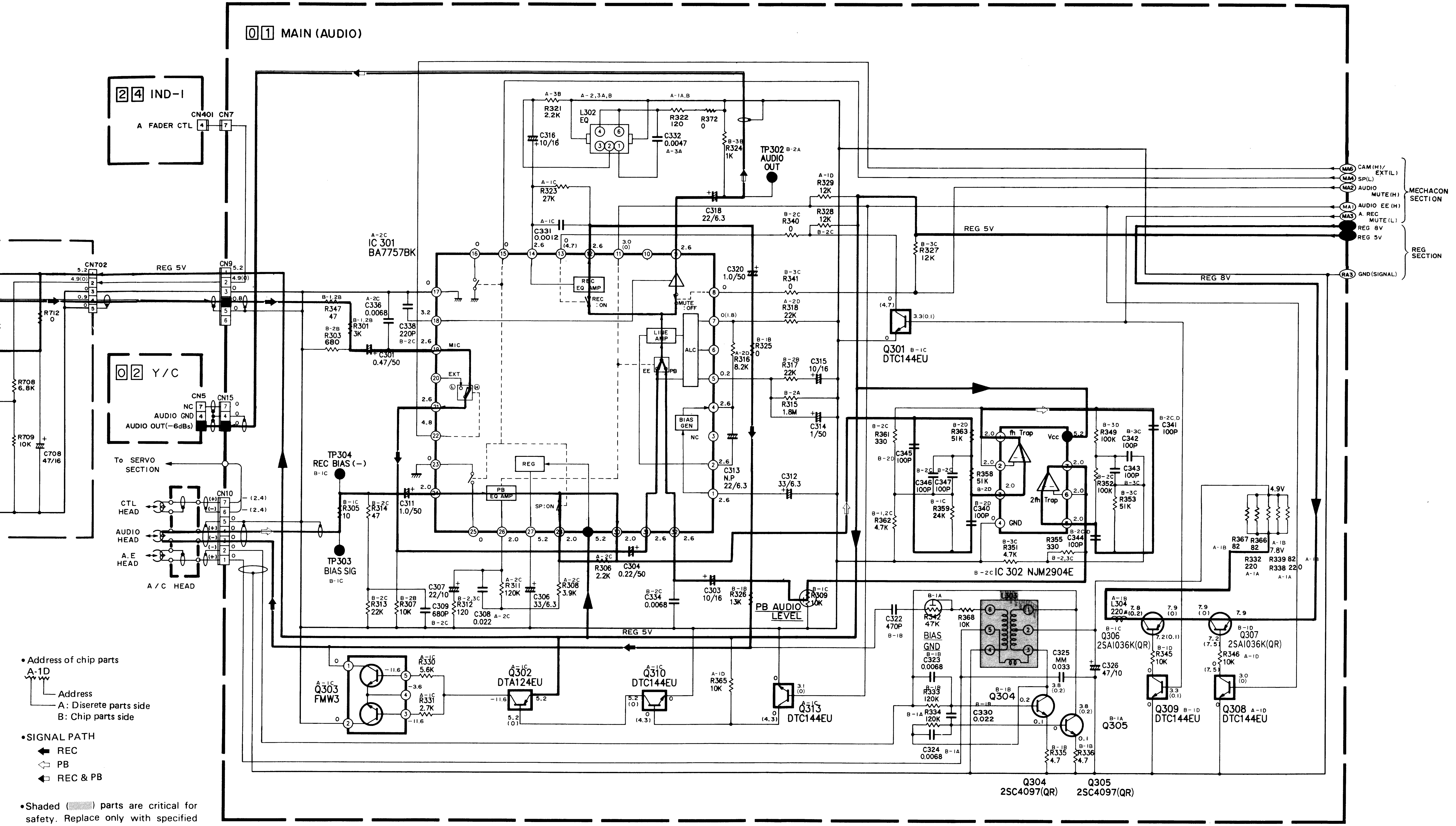

IC
TRANSISTOR
DIODE
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
B C E
G D S
CATHODE
ANODE
A C
1 OUT
3 GND
IN 2
A1 A2 C1 C2
ANODE 1 CATHODE 2
ANODE 2
C1/A2
C2/A1

5.6 AUDIO, MIC AMP & MIC JACK SCHEMATIC DIAGRAMS


0 1 MAIN (AUDIO)
2 4 IND-I
CN401 CN7
A FADER CTL
0 5 MIC JACK
WIRELESS MIC ADAPTER POWER
J1 EXT MIC
From 0 2 Y/C, CN3
GND
REG 5V
CN2
R1 10
CN1
MIC UNIT
2 6 MIC AMP
CN701
CN702
IC 701 M5282FP
R702 5.6K
C702 47/16
C703 47/4
R704 47K
C705 4.7/25
R705 220
C704 100P
C706 1500P
R706 22K
R701 1K
R703 1K
C701 4.7/25
C707 4.7/25
R711 2.2K
R712 0
R708 6.8K
R709 10K
C708 47/16
Vcc
NC
REG 5V
CN9
0 2 Y/C
CN5
CN15
NC
AUDIO GND
AUDIO OUT(-6dBs)
To SERVO SECTION
CTL HEAD
AUDIO HEAD
A.E HEAD
A/C HEAD
CN10
IC 301 BA7757BK
R321 2.2K
L302 EQ
R322 120
R372 0
C316 10/16
C332 0.0047
R324 1K
TP302 AUDIO OUT
R323 27K
C331 0.0012
C318 22/6.3
R329 12K
R328 12K
R340 0
REC EQ AMP
REC :ON
MUTE :OFF
LINE AMP
ALC
EE
PB
BIAS GEN
REG
PB EQ AMP
SP:ON
C320 1.0/50
R341 0
R318 22K
R325 0
R316 8.2K
R317 22K
C315 10/16
R315 1.8M
C314 1/50
C313 N.P 22/6.3
C312 33/6.3
R347 47
R301 3K
R303 680
C336 0.0068
C338 220P
C301 0.47/50
MIC
EXT
TP304 REC BIAS (-)
TP303 BIAS SIG
R305 10
R314 47
C311 1.0/50
R313 22K
R307 10K
C309 680P
C307 22/10
R312 120
C308 0.022
R311 120K
C306 33/6.3
R308 3.9K
R306 2.2K
C304 0.22/50
C334 0.0068
C303 10/16
R326 13K
R309 10K
PB AUDIO LEVEL
REG 5V
Q301 DTC144E
R361 330
C345 100P
R362 4.7K
C322 470P
Q303 FMW3
R330 5.6K
R331 2.7K
Q302 DTA124EU
Q310 DTC144EU
R365 10K
Q313 DTC144EU

- Address of chip parts
  A-1D
  Address
  A: Diserete parts side
  B: Chip parts side
- SIGNAL PATH
  - ⬅ REC
  - ⇦ PB
  - ⬅ REC & PB
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

- Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.



01 MAIN (AUDIO)
24 IND-I
CN401 CN7
A FADER CTL
02 Y/C
CN5 CN15
NC
AUDIO GND
AUDIO OUT(−6dBs)
CN702
CN9
REG 5V
R712 0
R708 6.8K
R709 10K
C708 47/16
To SERVO SECTION
CN10
CTL HEAD
AUDIO HEAD
A.E HEAD
A/C HEAD
IC 301 BA7757BK
IC 302 NJM2904E
REC EQ AMP
REC :ON
MUTE :OFF
LINE AMP
ALC
EE PB
BIAS GEN
NC
MIC
EXT
REG
PB EQ AMP
SP:ON
TP302 AUDIO OUT
TP304 REC BIAS (−)
TP303 BIAS SIG
PB AUDIO LEVEL
L302 EQ
R321 2.2K
C316 10/16
R322 120
R372 0
C332 0.0047
R324 1K
R323 27K
C331 0.0012
C318 22/6.3
R329 12K
R340 0
R328 12K
R327 12K
C320 1.0/50
R341 0
R318 22K
R325 0
R316 8.2K
R317 22K
C315 10/16
R315 1.8M
C314 1/50
C313 N.P 22/6.3
C312 33/6.3
R347 47
C336 0.0068
C338 220P
R301 3K
R303 680
C301 0.47/50
R305 10
R314 47
C311 1.0/50
R313 22K
R307 10K
C307 22/10
C309 680P
R312 120
C308 0.022
R311 120K
C306 33/6.3
R308 3.9K
R306 2.2K
C304 0.22/50
C334 0.0068
C303 10/16
R326 13K
R309 10K
Q301 DTC144EU
Q302 DTA124EU
Q303 FMW3
Q310 DTC144EU
Q313 DTC144EU
R330 5.6K
R331 2.7K
R365 10K
fh Trap
2fh Trap
Vcc
GND
R361 330
C345 100P
R363 51K
C346 100P
C347 100P
R358 51K
R359 24K
C340 100P
R362 4.7K
R351 4.7K
R355 330
C344 100P
R349 100K
C342 100P
C343 100P
R352 100K
R353 51K
C341 100P
R367 82
R366 82
R332 220
R339 82
R338 220
C322 470P
R342 47K
R368 10K
BIAS GND
L303
C323 0.0068
R333 120K
R334 120K
C324 0.0068
C330 0.022
C325 MM 0.033
Q304
Q305
R335 4.7
R336 4.7
L304 220μ
C326 47/10
Q306 2SA1036K(QR)
Q307 2SA1036K(QR)
R345 10K
R346 10K
Q309 DTC144EU
Q308 DTC144EU
Q304 2SC4097(QR)
Q305 2SC4097(QR)
REG 5V
REG 8V
MA6 CAM(H)/EXT(L)
MA4 SP(L)
MA2 AUDIO MUTE(H)
MA1 AUDIO EE(H)
MA3 A. REC MUTE(L)
REG 8V
REG 5V
RA3 GND(SIGNAL)
MECHACON SECTION
REG SECTION

- Address of chip parts
  A-1D
  Address
  A: Diserete parts side
  B: Chip parts side

- SIGNAL PATH
  - ⬅ REC
  - ⇦ PB
  - ⬅ REC & PB

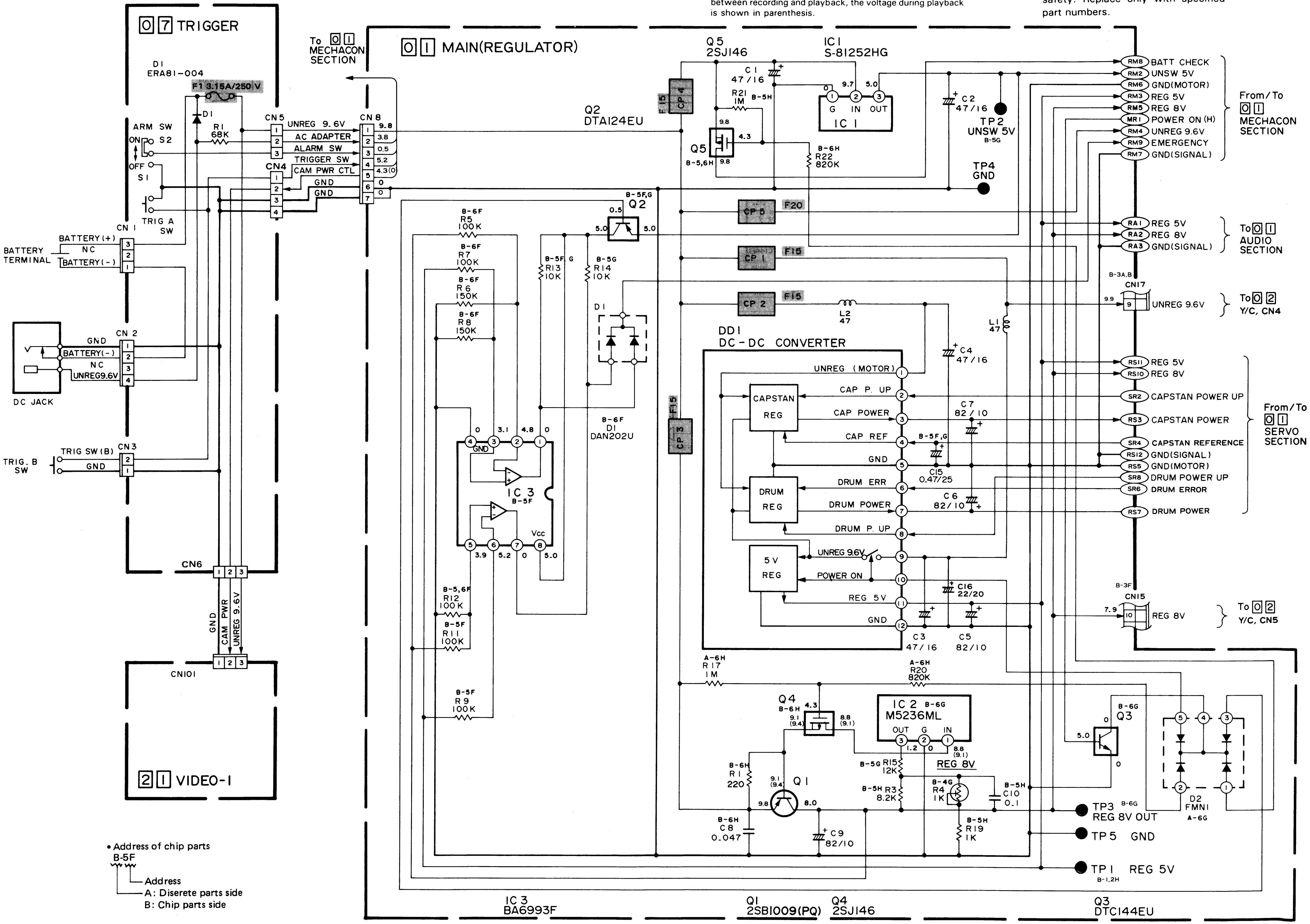
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

- Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

5.7 REGULATOR & TRIGGER SCHEMATIC DIAGRAM

- Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

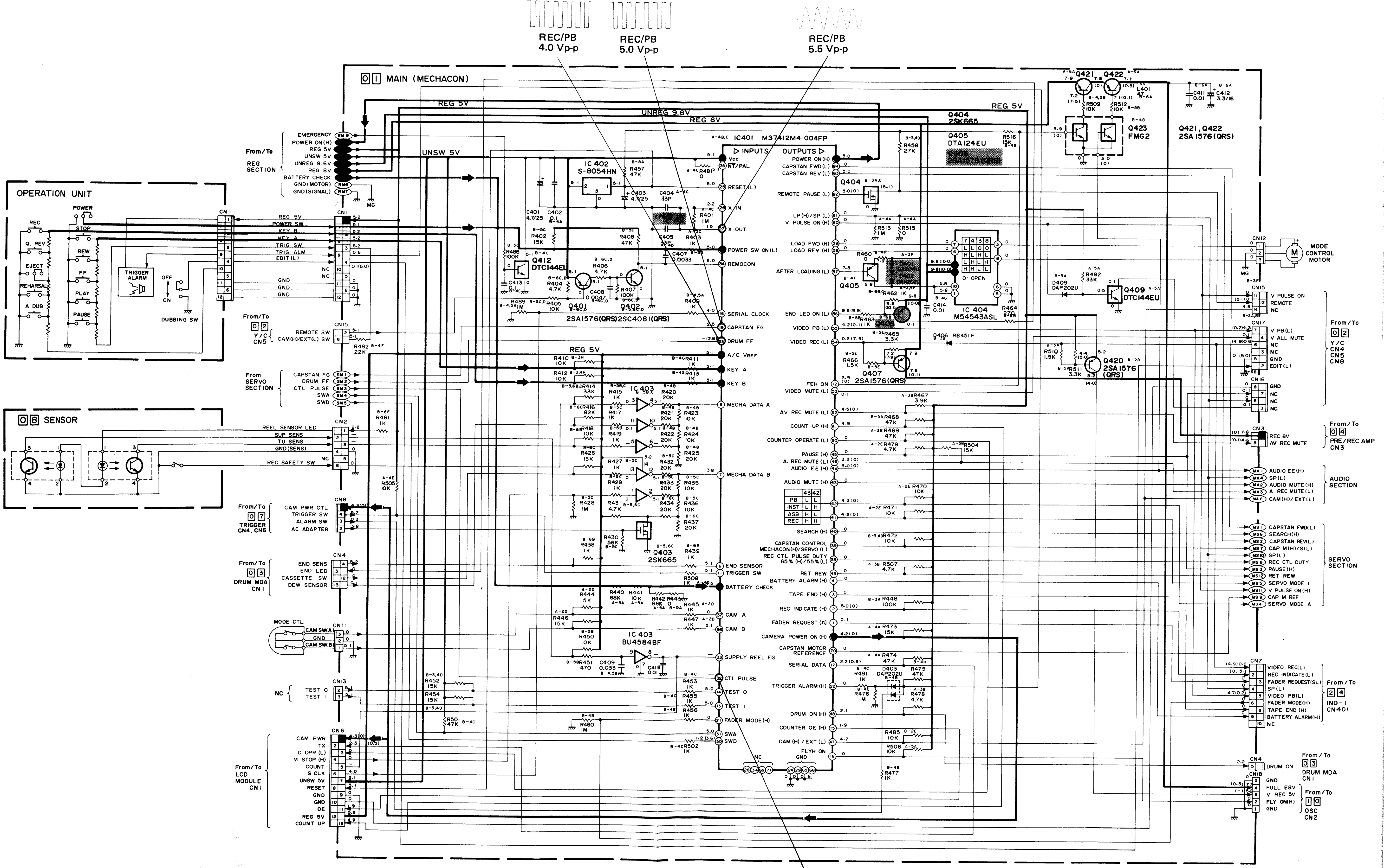
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

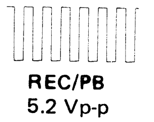


07 TRIGGER
D1 ERA81-004
F1 3.15A/250 V
ARM SW S2
ON
OFF
S1
TRIG A SW
R1 68K
CN5
UNREG 9.6V
AC ADAPTER
ALARM SW
TRIGGER SW
CN4
CAM PWR CTL
GND
CN1
BATTERY (+)
NC
BATTERY (-)
BATTERY TERMINAL
DC JACK
CN2
UNREG9.6V
CN3
TRIG SW (B)
TRIG. B SW
CN6
GND
CAM PWR
UNREG 9.6V
CN101
21 VIDEO-1
To 01 MECHACON SECTION
CN8
01 MAIN(REGULATOR)
Q2 DTA124EU
Q5 2SJ146
IC1 S-81252HG
C1 47/16
R21 1M
R22 820K
C2 47/16
TP2 UNSW 5V
TP4 GND
F15
CP4
CP5
F20
CP1
F16
CP2
F15
CP3
R5 100K
R7 100K
R6 150K
R8 150K
R13 10K
R14 10K
D1 DAN202U
IC3
L2 47
L1 47
C4 47/16
DD1 DC-DC CONVERTER
UNREG (MOTOR)
CAPSTAN REG
CAP P. UP
CAP POWER
CAP REF
GND
DRUM REG
DRUM ERR
DRUM POWER
DRUM P. UP
5V REG
UNREG 9.6V
POWER ON
REG 5V
C7 82/10
C15 0.47/25
C6 82/10
C16 22/20
C3 47/16
C5 82/10
R12 100K
R11 100K
R9 100K
R17 1M
R20 820K
Q4
IC2 M5236ML
OUT G IN
REG 8V
R1 220
Q1
R15 12K
R3 8.2K
R4 1K
C10 0.1
R19 1K
C8 0.047
C9 82/10
Q3
D2 FMN1
TP3 REG 8V OUT
TP5 GND
TP1 REG 5V
BATT CHECK
UNSW 5V
GND(MOTOR)
REG 5V
REG 8V
POWER ON (H)
UNREG 9.6V
EMERGENCY
GND(SIGNAL)
From/To 01 MECHACON SECTION
To 01 AUDIO SECTION
CN17
To 02 Y/C, CN4
CAPSTAN POWER UP
CAPSTAN POWER
CAPSTAN REFERENCE
DRUM POWER UP
DRUM ERROR
DRUM POWER
From/To 01 SERVO SECTION
CN15
To 02 Y/C, CN5
IC3 BA6993F
Q1 2SB1009(PQ)
Q4 2SJ146
Q3 DTC144EU

- Address of chip parts
B-5F
Address
A: Diserete parts side
B: Chip parts side

5.8 MECHACON SCHEMATIC DIAGRAM


REC/PB
4.0 Vp-p
REC/PB
5.0 Vp-p
REC/PB
5.5 Vp-p
01 MAIN (MECHACON)
OPERATION UNIT
POWER
REC
STOP
Q. REV
REW
EJECT
FF
REHARSAL
PLAY
A DUB
PAUSE
TRIGGER ALARM
OFF
ON
DUBBING SW
CN1
08 SENSOR
From/To REG SECTION
EMERGENCY
POWER ON(H)
REG 5V
UNSW 5V
UNREG 9.6V
REG 8V
BATTERY CHECK
GND(MOTOR)
GND(SIGNAL)
REG 5V
UNREG 9.6V
REG 8V
UNSW 5V
IC401 M37412M4-004FP
INPUTS
OUTPUTS
IC 402 S-8054HN
Q412 DTC144EU
Q401 2SA1576(QRS)
Q402 2SC4081(QRS)
IC 403
IC 403 BU4584BF
Q403 2SK665
Q404 2SK665
Q405 DTA124EU
Q406 2SA1576(QRS)
Q407 2SA1576(QRS)
IC 404 M54543ASL
Q409 DTC144EU
Q420 2SA1576(QRS)
Q421
Q422
Q423 FMG2
Q421, Q422 2SA1576(QRS)
D409 DAP202U
D403 DAP202U
D406 RB451F
MODE CONTROL MOTOR
CN12
CN15
CN17
CN16
CN3
CN7
CN4
CN18
CN2
CN8
CN11
CN13
CN6
From/To 02 Y/C CN5
REMOTE SW
CAM(H)/EXT(L) SW
From SERVO SECTION
CAPSTAN FG
DRUM FF
CTL PULSE
SWA
SWD
REEL SENSOR LED
SUP SENS
TU SENS
GND(SENS)
REC SAFETY SW
From/To 07 TRIGGER CN4, CN5
CAM PWR CTL
TRIGGER SW
ALARM SW
AC ADAPTER
From/To 03 DRUM MDA CN1
END SENS
END LED
CASSETTE SW
DEW SENSOR
MODE CTL
CAM SW(A)
GND
CAM SW(B)
NC
TEST 0
TEST 1
From/To LCD MODULE CN1
CAM PWR
TX
C OPR (L)
M STOP (H)
COUNT
S CLK
UNSW 5V
RESET
GND
GND
OE
REG 5V
COUNT UP
From/To 02 Y/C CN4 CN5 CN8
V PULSE ON
REMOTE
V PB(L)
V ALL MUTE
GND
EDIT(L)
From/To 04 PRE/REC AMP CN3
REC 8V
AV REC MUTE
AUDIO SECTION
AUDIO EE(H)
SP(L)
AUDIO MUTE(H)
A REC MUTE(L)
CAM(H)/EXT(L)
SERVO SECTION
CAPSTAN FWD(L)
SEARCH(H)
CAPSTAN REV(L)
CAP M(H)/S(L)
SP(L)
REC CTL DUTY
PAUSE(H)
RET REW
SERVO MODE 1
V PULSE ON(H)
CAP M REF
SERVO MODE A
From/To 24 IND-1 CN401
VIDEO REC(L)
REC INDICATE(L)
FADER REQUEST(L)
SP(L)
VIDEO PB(L)
FADER MODE(H)
TAPE END (H)
BATTERY ALARM(H)
NC
From/To 03 DRUM MDA CN1
DRUM ON
From/To 10 OSC CN2
GND
FULL E8V
V REC 5V
FLY ON(H)
GND


REC/PB
5.2 Vp-p

•Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

• Waveform : Measured with a color bar during recording and play back with alignment tape.

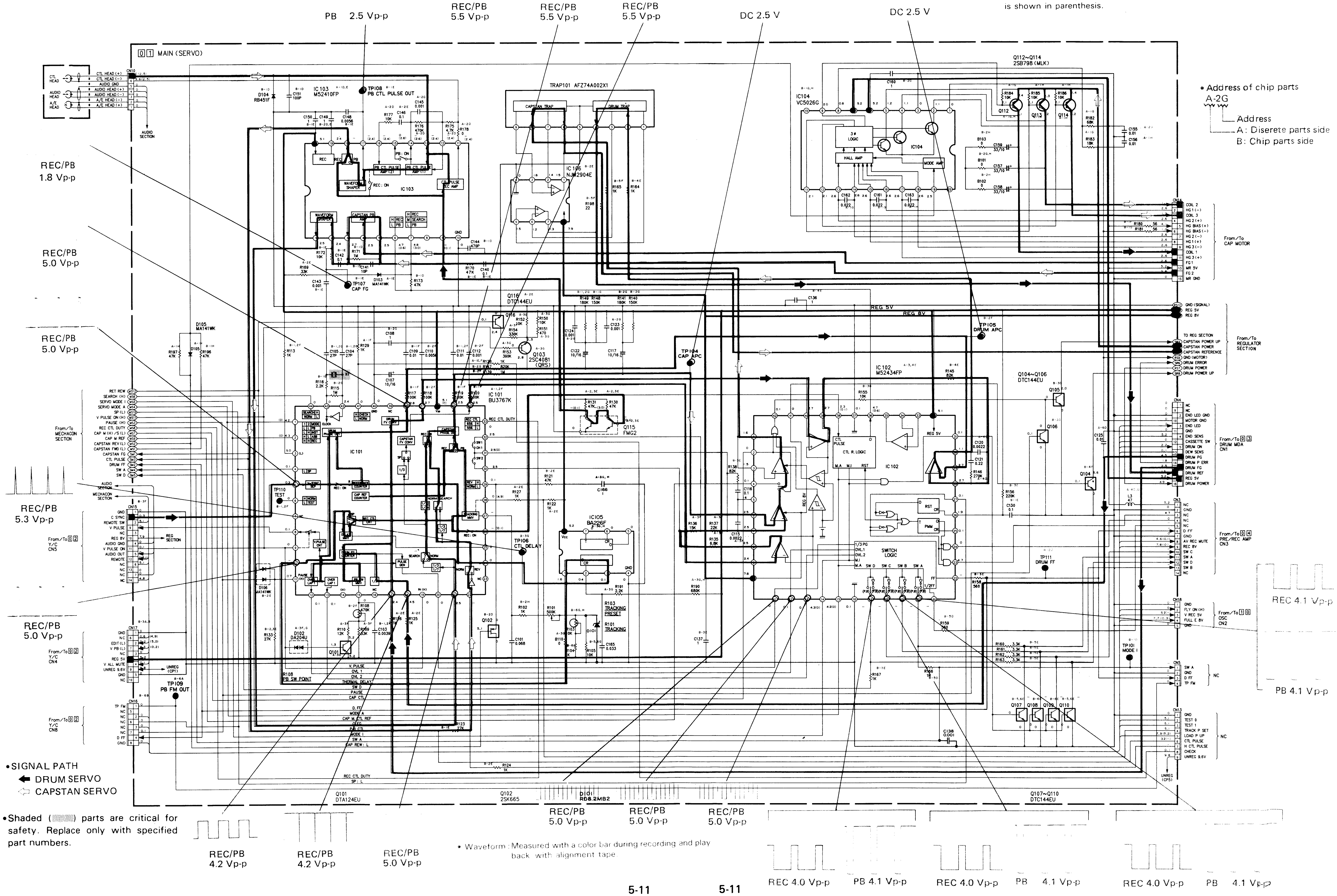
← MAIN SIGNAL PATH

• Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

• Address of chip parts
B-4C
Address
A: Diserete parts side
B: Chip parts side

5.9 SERVO SCHEMATIC DIAGRAM

- Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.



PB 2.5 Vp-p
REC/PB 5.5 Vp-p
REC/PB 5.5 Vp-p
REC/PB 5.5 Vp-p
DC 2.5 V
DC 2.5 V
REC/PB 1.8 Vp-p
REC/PB 5.0 Vp-p
REC/PB 5.0 Vp-p
REC/PB 5.3 Vp-p
REC/PB 5.0 Vp-p
REC/PB 4.2 Vp-p
REC/PB 4.2 Vp-p
REC/PB 5.0 Vp-p
REC/PB 5.0 Vp-p
REC/PB 5.0 Vp-p
REC/PB 5.0 Vp-p
REC 4.1 Vp-p
PB 4.1 Vp-p
REC 4.0 Vp-p
PB 4.1 Vp-p
REC 4.0 Vp-p
PB 4.1 Vp-p
REC 4.0 Vp-p
PB 4.1 Vp-p
01 MAIN (SERVO)
CTL HEAD
AUDIO HEAD
A/E HEAD
AUDIO SECTION
IC103 M52410FP
TP108 PB CTL PULSE OUT
D104 RB451F
TRAP101 AFZ74A002X1
CAPSTAN TRAP
DRUM TRAP
IC106 NJM2904E
IC104 VC5026G
Q112~Q114 2SB798 (MLK)
TP107 CAP FG
D103 MA141WK
Q116 DTC144EU
Q103 2SC4081 (QRS)
TP104 CAP APC
TP105 DRUM APC
IC102 M52434FP
IC101 BU3767K
Q115 FMG2
IC105 BA226F
TP106 CTL DELAY
TP110 TEST
D105 MA141WK
D106 MA141WK
D102 DA204U
TP109 PB FM OUT
R103 TRACKING PRESET
R101 TRACKING
TP111 DRUM FF
TP101 MODE I
Q104~Q106 DTC144EU
Q107 Q108 Q109 Q110
From/To CAP MOTOR
From/To REGULATOR SECTION
From/To 03 DRUM MDA CN1
From/To 04 PRE/REC AMP CN3
From/To 10 OSC CN2
NC
From/To MECHACON SECTION
From/To 02 Y/C CN5
From/To 02 Y/C CN4
From/To 02 Y/C CN8
REG SECTION
REG 5V
REG 8V
Q101 DTA124EU
Q102 2SK665
D101 RD8.2MB2
Q107~Q110 DTC144EU

- Address of chip parts

A-2G

Address

A : Diserete parts side

B : Chip parts side

- SIGNAL PATH

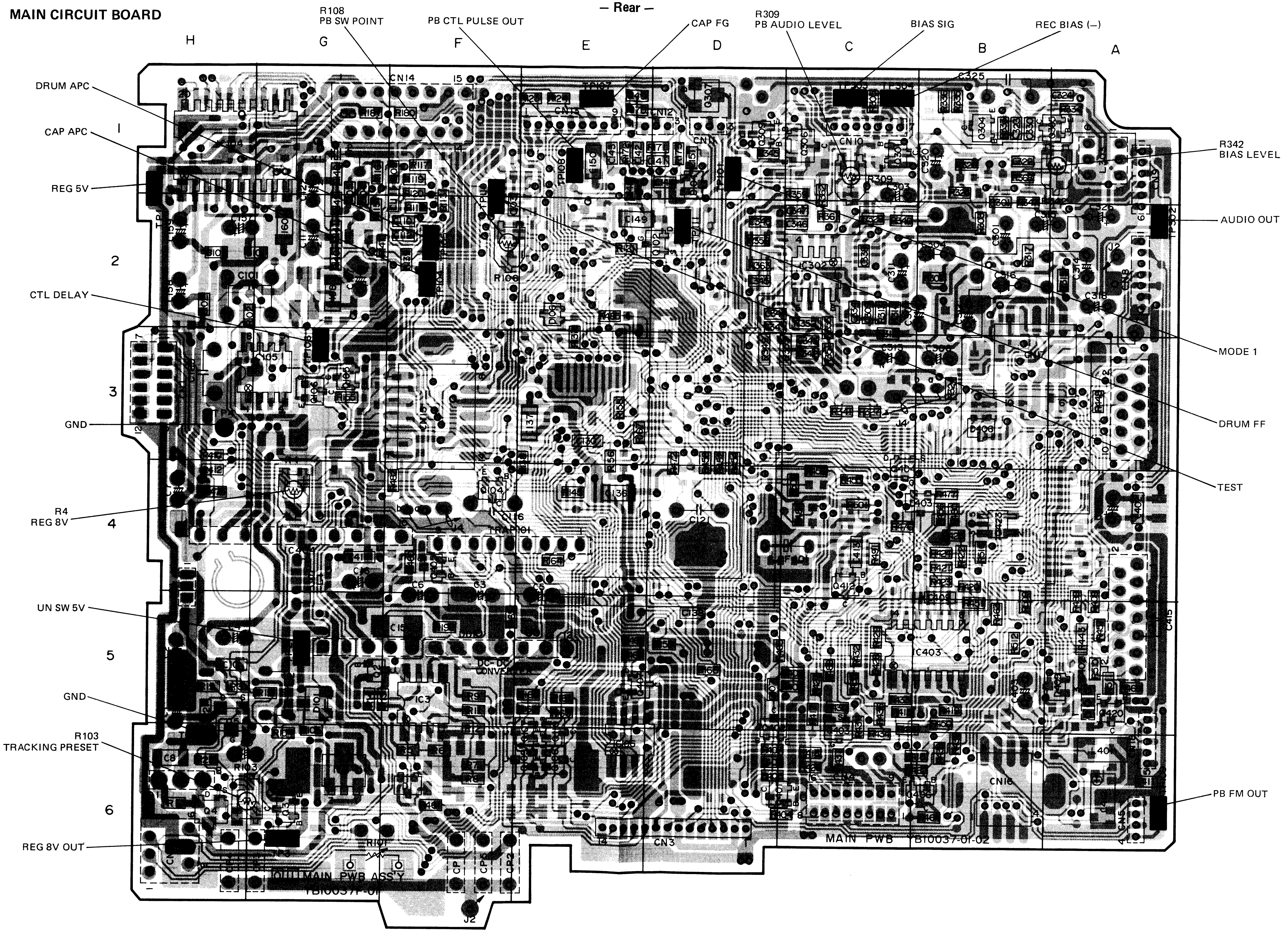
◀ DRUM SERVO

◁ CAPSTAN SERVO

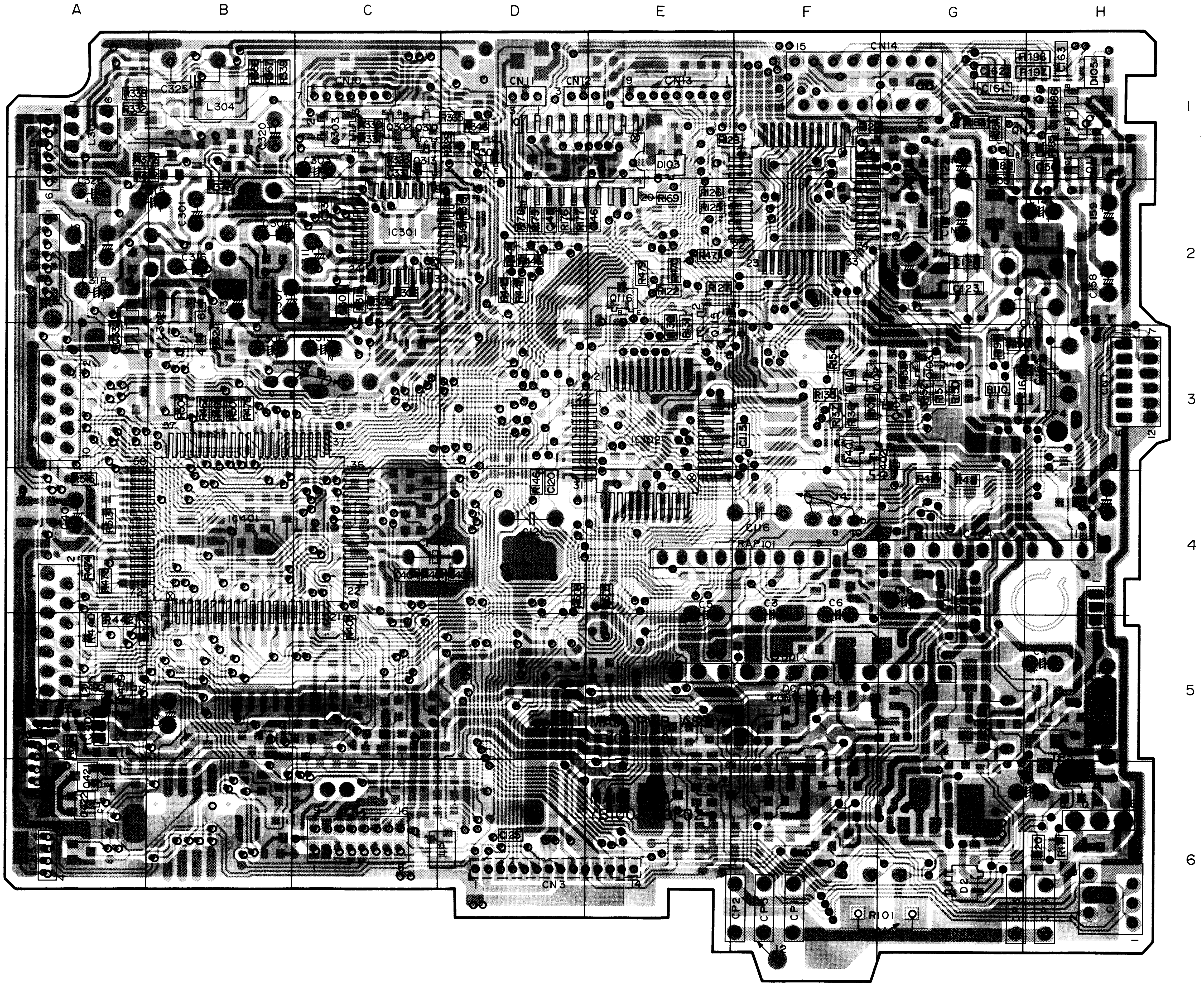
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

- Waveform : Measured with a color bar during recording and play back with alignment tape.

5.10 MAIN CIRCUIT BOARD

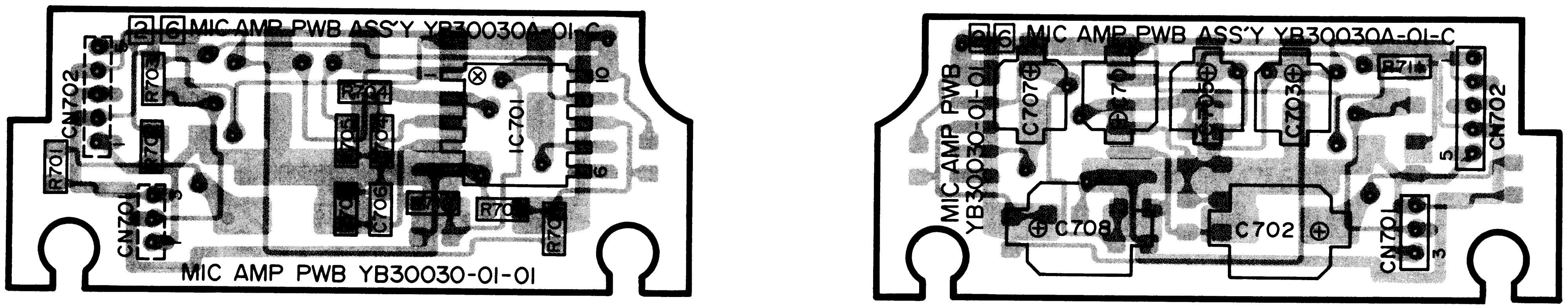

— Rear —
R108
PB SW POINT
PB CTL PULSE OUT
CAP FG
R309
PB AUDIO LEVEL
BIAS SIG
REC BIAS (−)
H
G
F
E
D
C
B
A
DRUM APC
CAP APC
I
REG 5V
2
CTL DELAY
3
GND
R4
REG 8V
4
UN SW 5V
5
GND
R103
TRACKING PRESET
6
REG 8V OUT
R342
BIAS LEVEL
AUDIO OUT
MODE 1
DRUM FF
TEST
PB FM OUT
MAIN PWB B10037-01-02
(O)(I) MAIN PWB ASS'Y
TB10037-01
CN3
J2
R101
R106
R309
IC302
IC403
IC3
CN16
CN10
CN14
CN15
CN12
CN11
DC-DC CONVERTER

— Front —


A
B
C
D
E
F
G
H
1
2
3
4
5
6
CN10
CN11
CN12
CN13
CN14
CN1
CN3
CN6
IC301
IC401
IC102
IC103
IC101
IC404
L304
C325
C320
C116
C121
TRAP101
D103
D105
Q116
R101
CP1
CP2
C3
C5
C6
DC-DC CONVERTER

5.11 MIC AMP, MIC JACK, TRIGGER & JACK CIRCUIT BOARDS

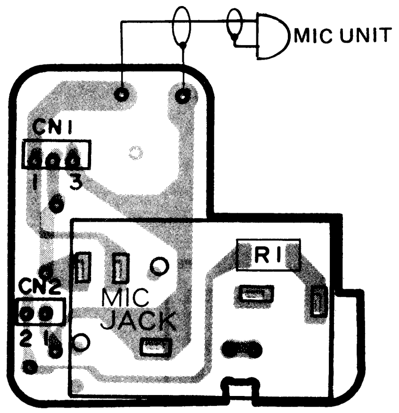
— MIC AMP —


2 6 MIC AMP PWB ASS'Y YB30030A-01-C
CN702
R703
R701
R702
CN701
R704
IC701
C706
C705
C704
R705
R706
MIC AMP PWB YB30030-01-01
MIC AMP PWB
YB30030-01-01
C707
C701
C705
C703
R711
CN702
C708
C702
CN701
5
3
10
6

— Rear —

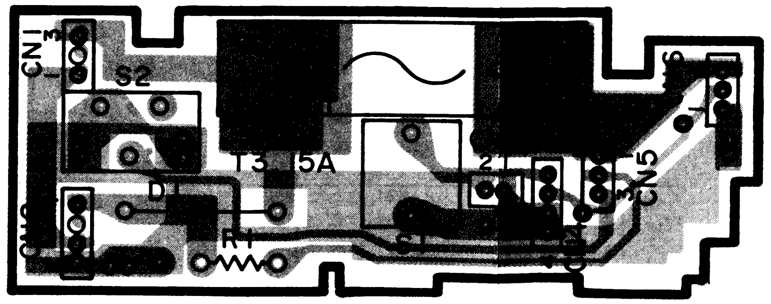
— Front —

— MIC JACK —


MIC UNIT
CN1
1
3
CN2
2
1
MIC
JACK
R1

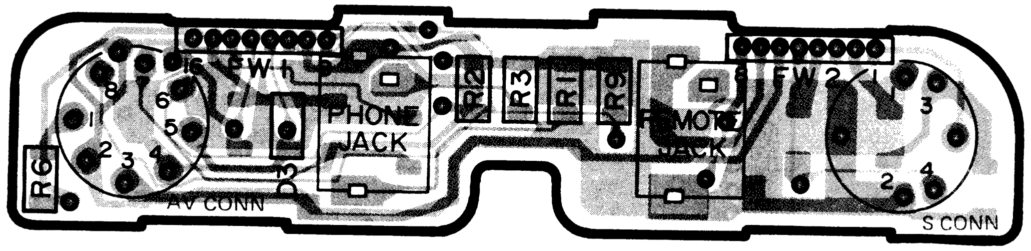
0 5 MIC JACK PWB ASS'Y YB20079A1
MIC JACK PWB YB20079-03-01

— TRIGGER —


CN1
S2
T3.15A
D1
R1
C1
CN5
CN2

0 7 TRIGGER PWB ASS'Y YB20079B3-01
TRIGGER PWB YB20079-03-01

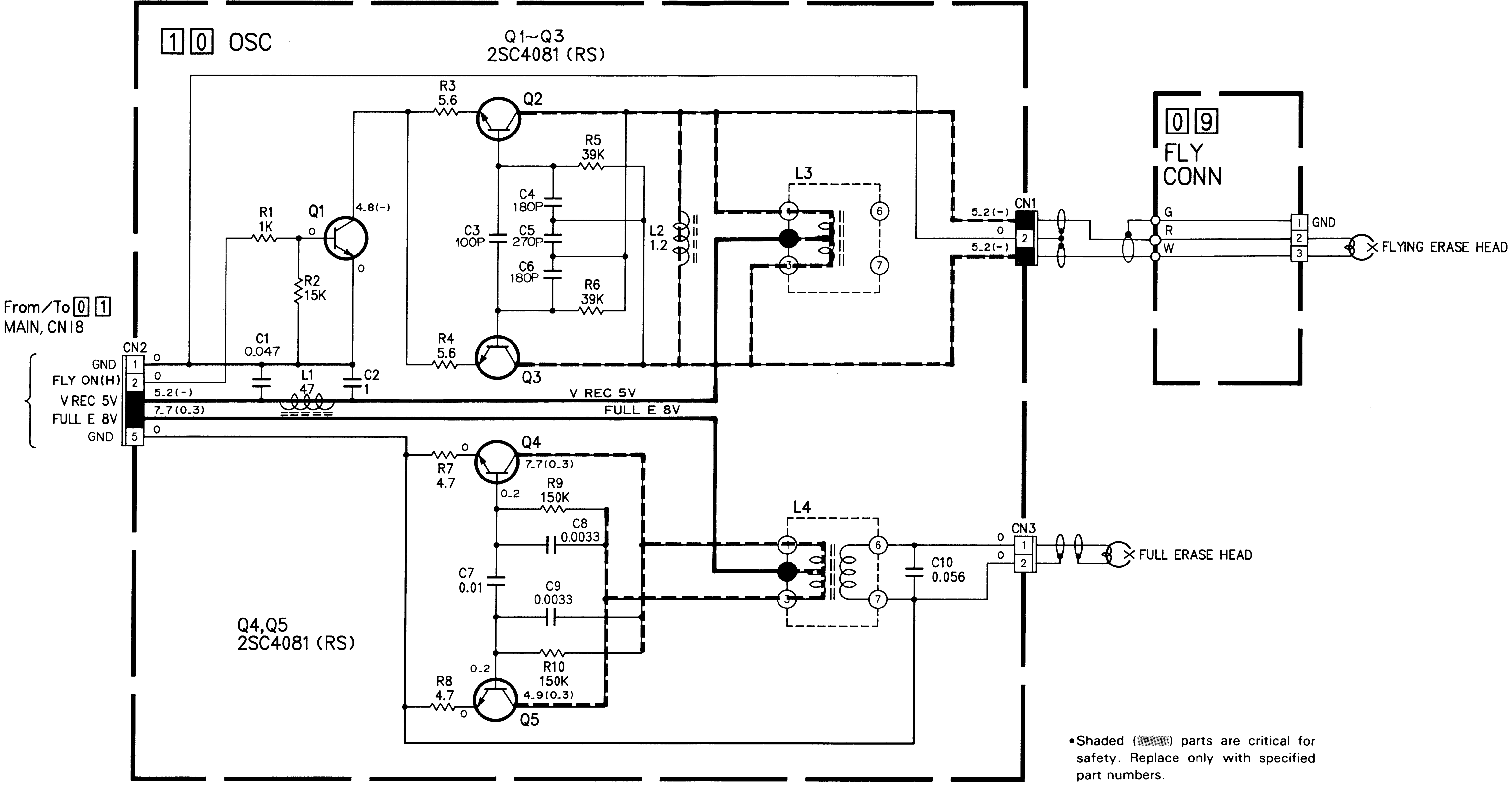
— JACK —


FW 1
FW 2
R6
R2
R3
R1
R9
D3
PHONE JACK
REMOTE JACK
AV CONN
S CONN

0 6 JACK PWB ASS'Y YB20079D2
JACK PWB YB20079-03-01

5.12 OSC SCHEMATIC DIAGRAM & CIRCUIT BOARD

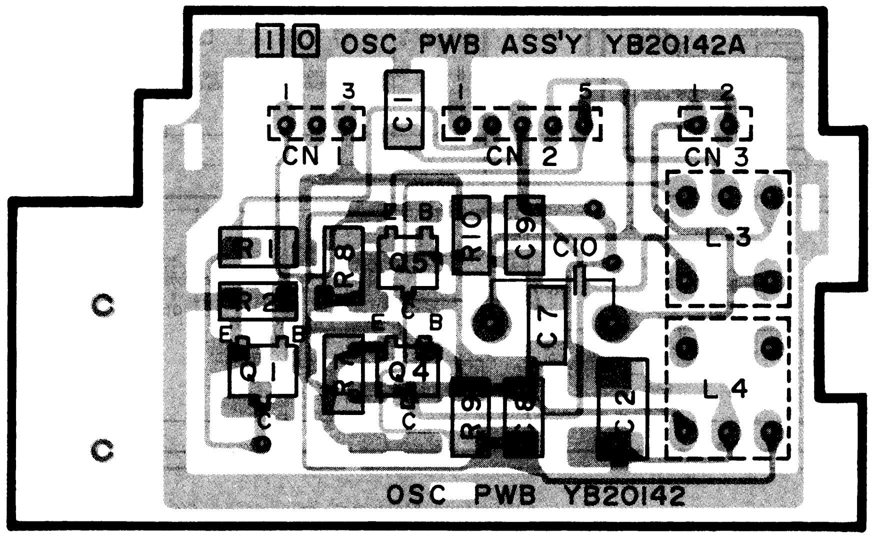
- Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.



10 OSC
Q1~Q3
2SC4081 (RS)
R3 5.6
Q2
R5 39K
C4 180P
C3 100P
C5 270P
C6 180P
R6 39K
L2 1.2
L3
R1 1K
Q1
4.8(-)
R2 15K
R4 5.6
Q3
From/To 01
MAIN, CN18
CN2
GND
FLY ON(H)
V REC 5V
FULL E 8V
GND
C1 0.047
L1 47
C2 1
5.2(-)
7.7(0.3)
V REC 5V
FULL E 8V
CN1
5.2(-)
5.2(-)
09
FLY
CONN
G
R
W
GND
FLYING ERASE HEAD
Q4
R7 4.7
7.7(0.3)
0.2
R9 150K
C8 0.0033
C7 0.01
C9 0.0033
L4
C10 0.056
CN3
FULL ERASE HEAD
Q4,Q5
2SC4081 (RS)
0.2
R8 4.7
R10 150K
4.9(0.3)
Q5

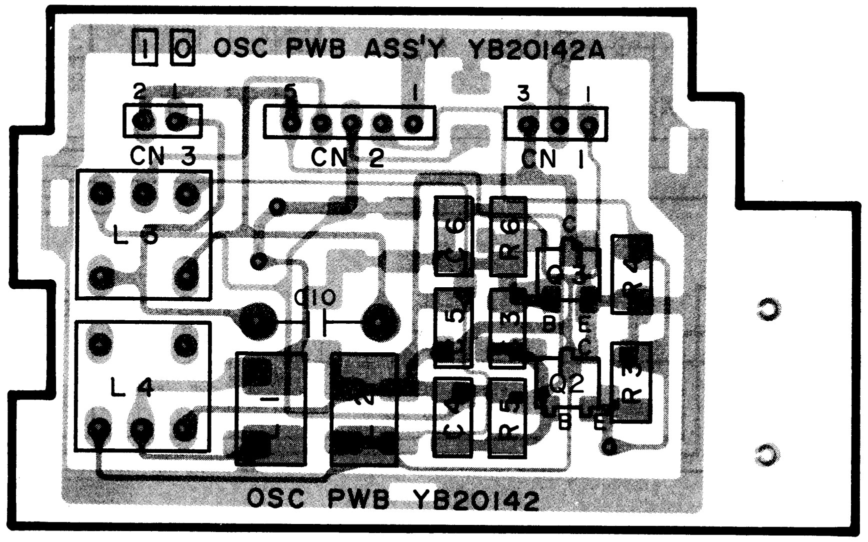
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

— Rear —



10 OSC PWB ASS'Y YB20142A
CN 1
CN 2
CN 3
C1
R1
R2
Q1
R8
C8
R10
C9
C10
L 3
L 4
C7
Q4
R9
C2
OSC PWB YB20142

— Front —

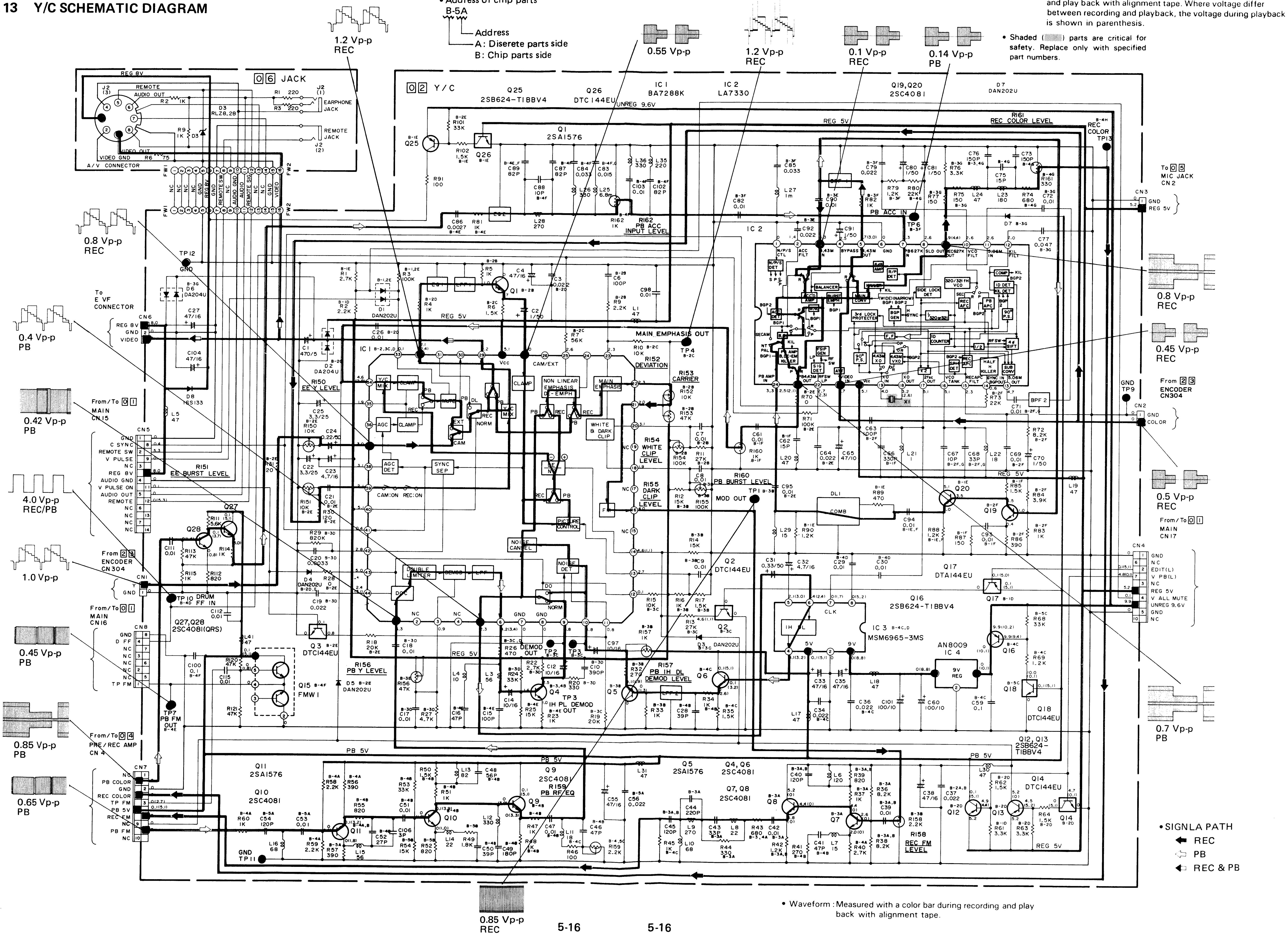


10 OSC PWB ASS'Y YB20142A
CN 3
CN 2
CN 1
L 3
L 4
C10
C6
R6
Q3
R4
C5
C4
R5
Q2
R3
OSC PWB YB20142

5.13 Y/C SCHEMATIC DIAGRAM

- Address of chip parts
  B-5A
  Address
  A: Diserete parts side
  B: Chip parts side

- Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

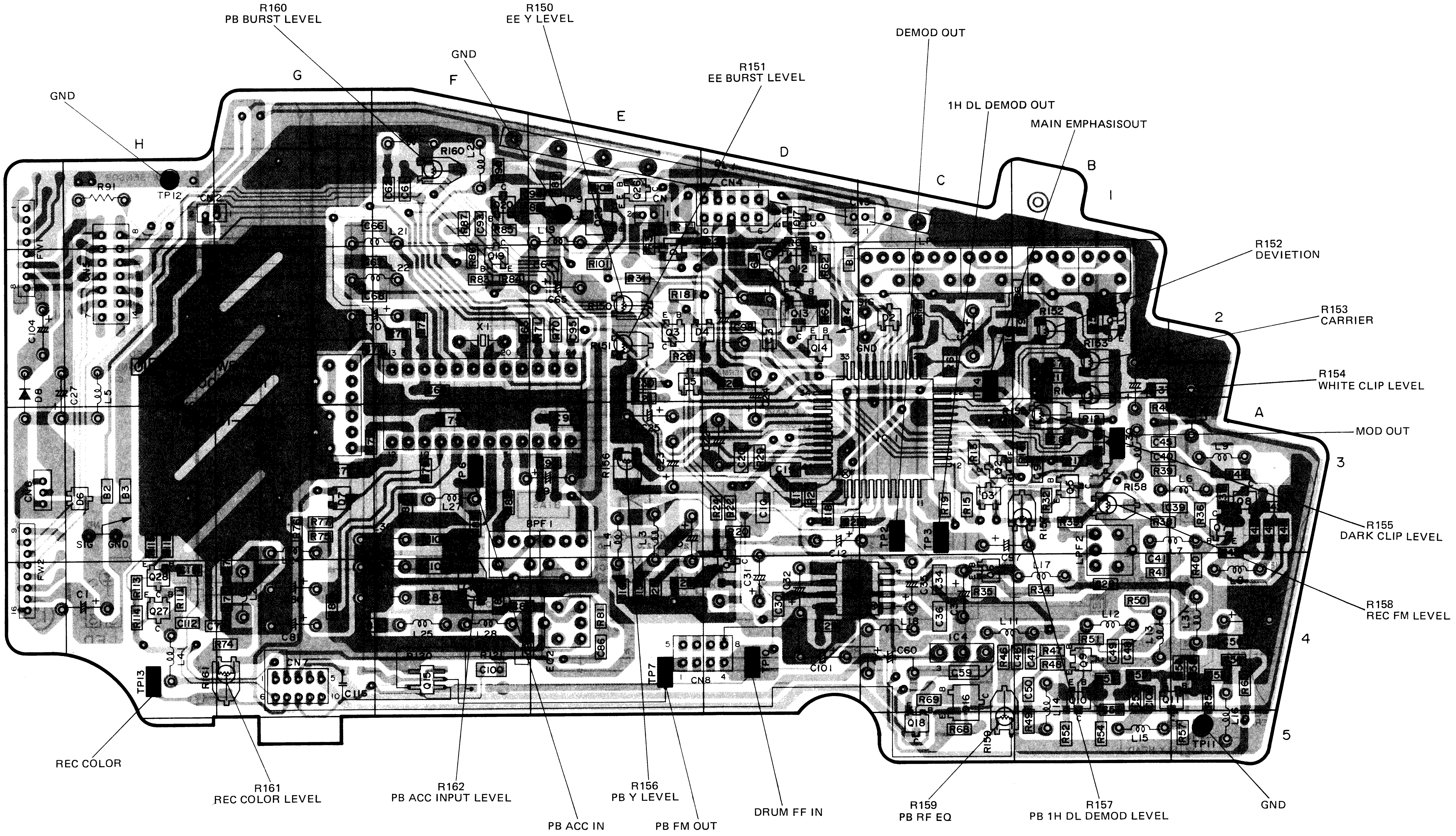


1.2 Vp-p
REC
0.55 Vp-p
1.2 Vp-p
REC
0.1 Vp-p
REC
0.14 Vp-p
PB
0.8 Vp-p
REC
0.4 Vp-p
PB
0.42 Vp-p
PB
4.0 Vp-p
REC/PB
1.0 Vp-p
0.45 Vp-p
PB
0.85 Vp-p
PB
0.65 Vp-p
PB
0.8 Vp-p
REC
0.45 Vp-p
REC
0.5 Vp-p
REC
0.7 Vp-p
PB
0.85 Vp-p
REC
06 JACK
02 Y/C
A/V CONNECTOR
REMOTE
AUDIO OUT
VIDEO OUT
VIDEO GND
EARPHONE JACK
REMOTE JACK
REG 8V
Q25 2SB624-T1BBV4
Q26 DTC144EU
UNREG 9.6V
IC1 BA7288K
IC2 LA7330
Q19,Q20 2SC4081
D7 DAN202U
Q1 2SA1576
REG 5V
R161 REC COLOR LEVEL
REC COLOR TP13
R162 PB ACC INPUT LEVEL
PB ACC IN
TP6
TP12
To E VF CONNECTOR
CN6
D6 DA204U
D1 DAN202U
D2 DA204U
D8 1SS133
R150 EE Y LEVEL
R151 EE BURST LEVEL
MAIN EMPHASIS OUT
TP4
R152 DEVIATION
R153 CARRIER
R154 WHITE CLIP LEVEL
R155 DARK CLIP LEVEL
R160 PB BURST LEVEL
TP1
MOD OUT
Y/C MIX
CLAMP
AGC
AGC DET
SYNC SEP
CAM/EXT
NON LINEAR EMPHASIS
DE-EMPH
MAIN EMPHASIS
WHITE & DARK CLIP
PICTURE CONTROL
NOISE CANCEL
NOISE DET
DOUBLE LIMITER
DEMOD
LPF
DOC
CAMION REC:ON
From/To 01 MAIN CN15
CN5
C SYNC
REMOTE SW
V PULSE
REG 8V
AUDIO GND
V PULSE ON
AUDIO OUT
Q27,Q28 2SC4081(QRS)
From 23 ENCODER CN304
CN1
TP10 DRUM FF IN
Q3 DTC144EU
Q15 FMW1
D4 DA202U
D5 DAN202U
R156 PB Y LEVEL
From/To 01 MAIN CN16
CN8
D FF
TP FM
TP7 PB FM OUT
From/To 04 PRE/REC AMP CN4
CN7
PB COLOR
REC COLOR
PB 5V
REC FM
PB FM
TP2 DEMOD OUT
TP3 IH PL DEMOD OUT
R157 PB 1H DL DEMOD LEVEL
Q2 DTC144EU
Q17 DTA144EU
Q16 2SB624-T1BBV4
IC3 MSM6965-3MS
AN8009 IC4
1H DL
CLK
9V REG
Q18 DTC144EU
Q12, Q13 2SB624-T1BBV4
Q14 DTC144EU
Q11 2SA1576
Q10 2SC4081
Q9 2SC4081
R159 PB RF/EQ
Q5 2SA1576
Q4, Q6 2SC4081
Q7, Q8 2SC4081
R158 REC FM LEVEL
GND TP11
PB 5V
DL1 COMB
X1
BPF 2
To 05 MIC JACK CN2
CN3
GND TP9
From 23 ENCODER CN304
CN2
GND COLOR
From/To 01 MAIN CN17
CN4
EDIT(L)
V PB(L)
V ALL MUTE
UNREG 9.6V
BALANCER
ACC AMP
BURST EMPH
MAIN CONV
SIDE LOCK DET
320/321 fH VCO
ID DET
KIL DET
APC
AFC
PB APC
3rd LOCK PROTECTER
4.43M XO
4.43M VXO
SUB CONV
HALF H KILLER
SECAM
COUNTER

- SIGNLA PATH
  - ◀ REC
  - ⇦ PB
  - ◀ REC & PB

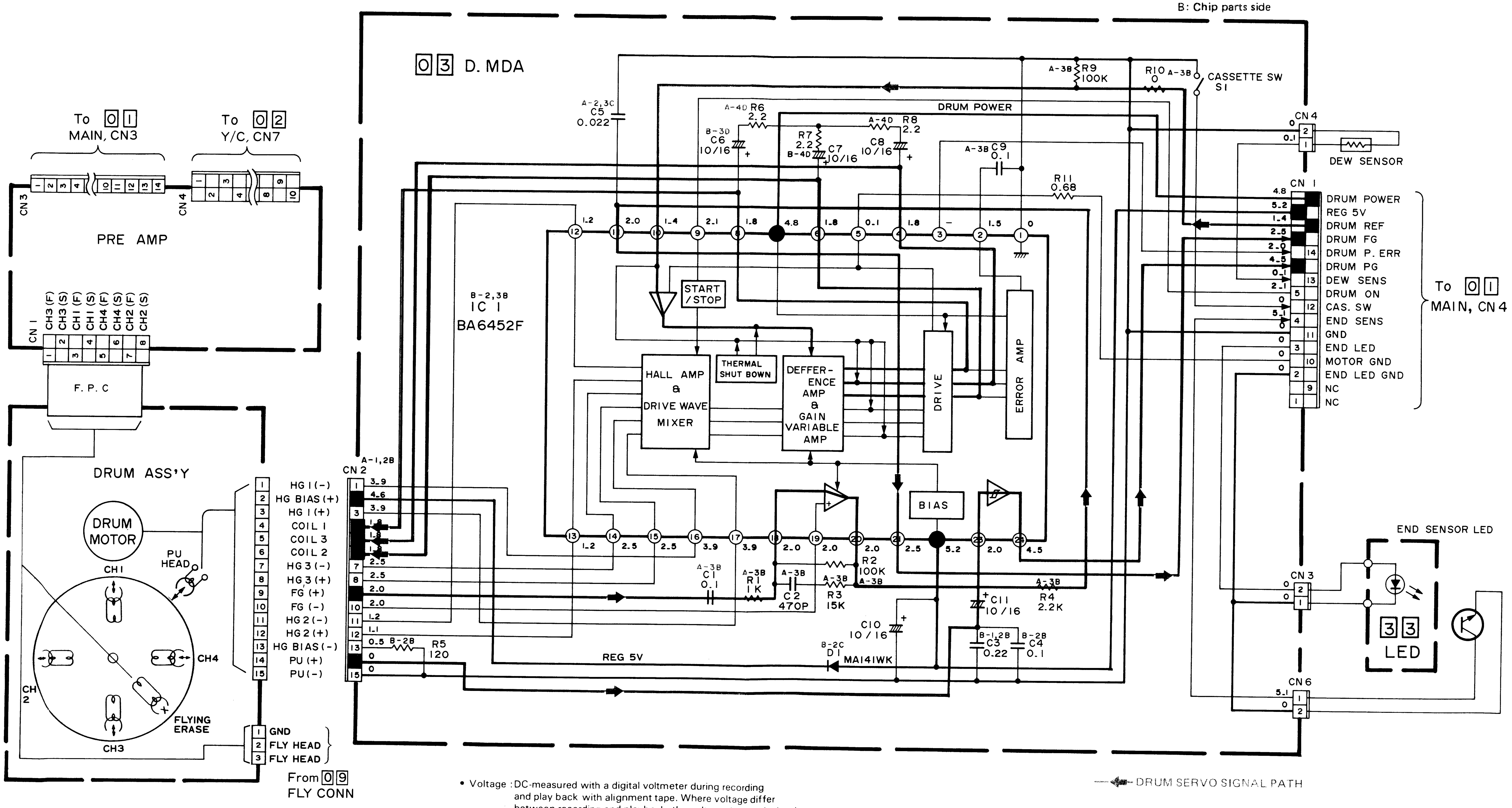
- Waveform : Measured with a color bar during recording and play back with alignment tape.

5.14 Y/C CIRCUIT BOARD


R160
PB BURST LEVEL
R150
EE Y LEVEL
GND
R151
EE BURST LEVEL
DEMOD OUT
1H DL DEMOD OUT
MAIN EMPHASISOUT
GND
H
G
F
E
D
C
B
I
A
2
3
4
5
TP12
TP13
TP11
R152
DEVIETION
R153
CARRIER
R154
WHITE CLIP LEVEL
MOD OUT
R155
DARK CLIP LEVEL
R158
REC FM LEVEL
REC COLOR
R161
REC COLOR LEVEL
R162
PB ACC INPUT LEVEL
PB ACC IN
R156
PB Y LEVEL
PB FM OUT
DRUM FF IN
R159
PB RF EQ
R157
PB 1H DL DEMOD LEVEL
GND

5.15 DRUM MDA SCHEMATIC DIAGRAM

• Address of chip parts
A-3B
Address
A: Diserete parts side
B: Chip parts side


03 D. MDA
To 01 MAIN, CN3
To 02 Y/C, CN7
CN3
CN4
PRE AMP
CN1
CH3 (F)
CH3 (S)
CH1 (F)
CH1 (S)
CH4 (F)
CH4 (S)
CH2 (F)
CH2 (S)
F. P. C
DRUM ASS'Y
DRUM MOTOR
PU HEAD
CH1
CH4
CH2
CH3
FLYING ERASE
HG 1 (-)
HG BIAS (+)
HG 1 (+)
COIL 1
COIL 3
COIL 2
HG 3 (-)
HG 3 (+)
FG (+)
FG (-)
HG 2 (-)
HG 2 (+)
HG BIAS (-)
PU (+)
PU (-)
GND
FLY HEAD
FLY HEAD
From 09 FLY CONN
A-1,2B
CN 2
B-2,3B
IC 1
BA6452F
START /STOP
HALL AMP & DRIVE WAVE MIXER
THERMAL SHUT BOWN
DEFFER-ENCE AMP & GAIN VARIABLE AMP
DRIVE
ERROR AMP
BIAS
DRUM POWER
REG 5V
A-2,3C C5 0.022
A-4D R6 2.2
B-3D C6 10/16
R7 2.2
B-4D C7 10/16
A-4D R8 2.2
C8 10/16
A-3B C9 0.1
A-3B R9 100K
R10 A-3B 0
CASSETTE SW S1
R11 0.68
A-3B C1 0.1
A-3B R1 1K
A-3B C2 470P
R2 100K A-3B
A-3B R3 15K
C10 10/16
B-2C D1 MA141WK
C11 10/16
A-3B R4 2.2K
B-1,2B C3 0.22
B-2B C4 0.1
B-2B R5 120
CN 4
DEW SENSOR
CN 1
DRUM POWER
REG 5V
DRUM REF
DRUM FG
DRUM P. ERR
DRUM PG
DEW SENS
DRUM ON
CAS. SW
END SENS
GND
END LED
MOTOR GND
END LED GND
NC
NC
To 01 MAIN, CN4
END SENSOR LED
CN 3
CN 6
33 LED

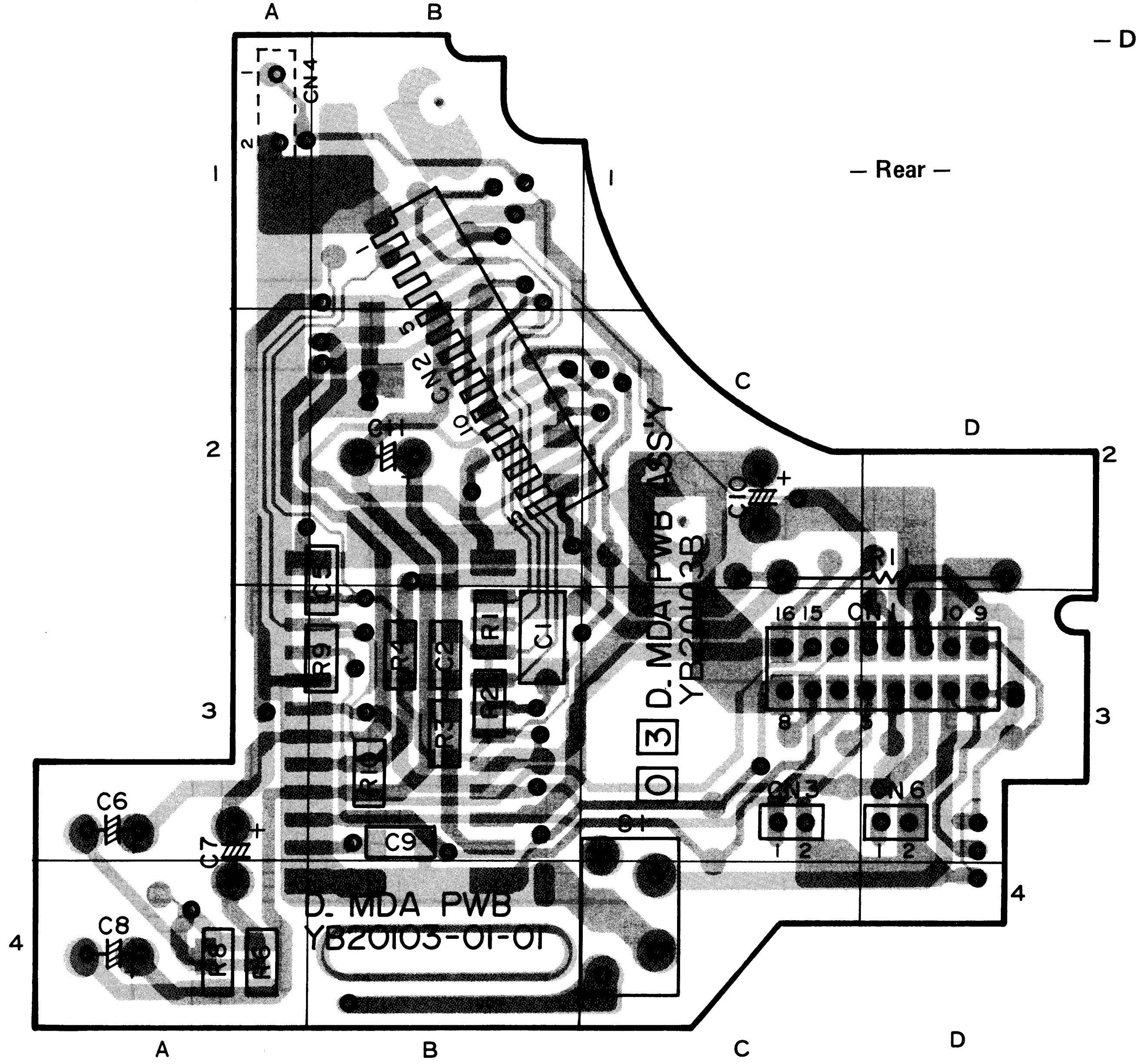
• Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

DRUM SERVO SIGNAL PATH

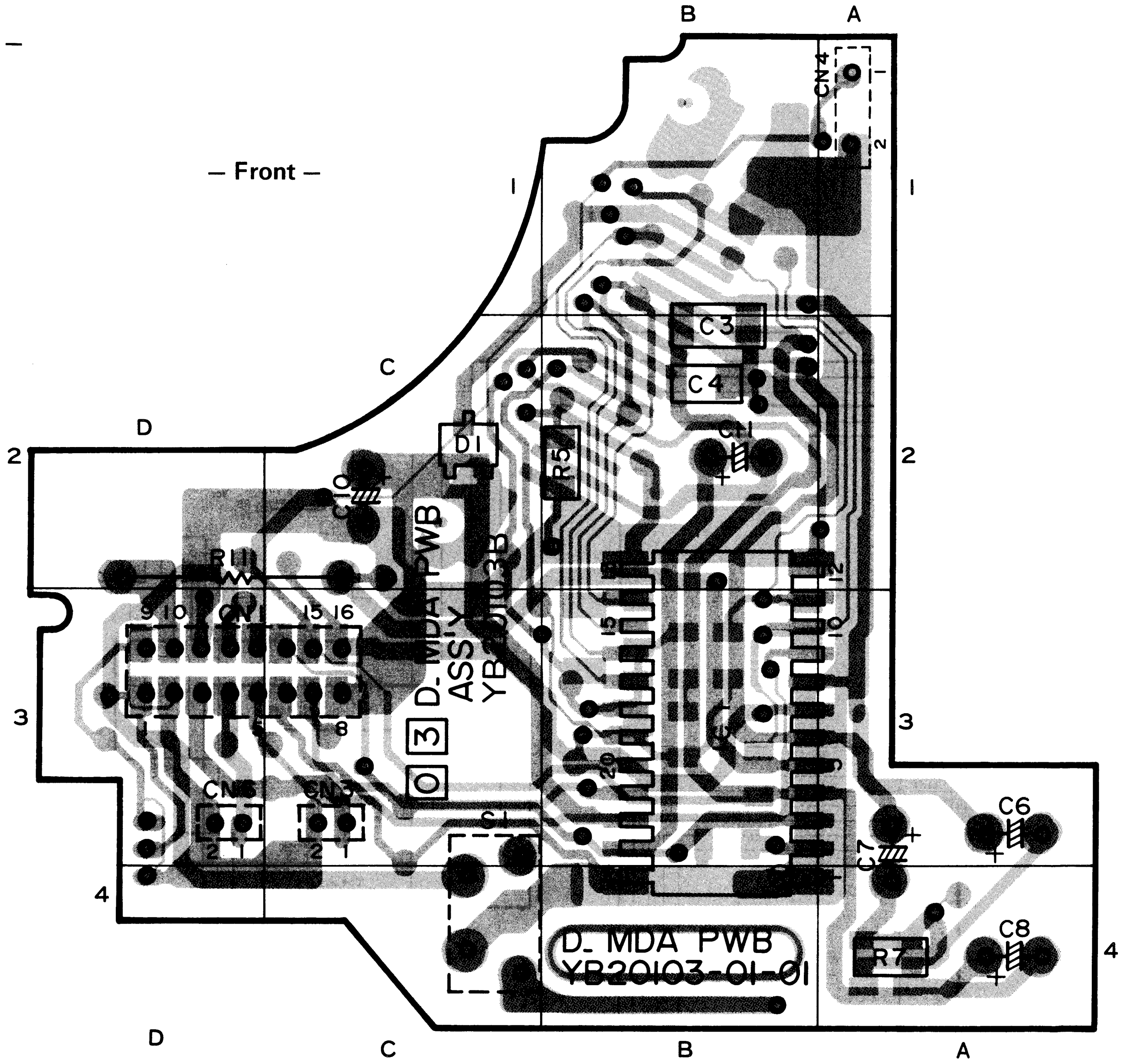
5.16 DRUM MDA, UPPER DRUM & FLY CONN CIRCUIT BOARDS

– DRUM MDA –

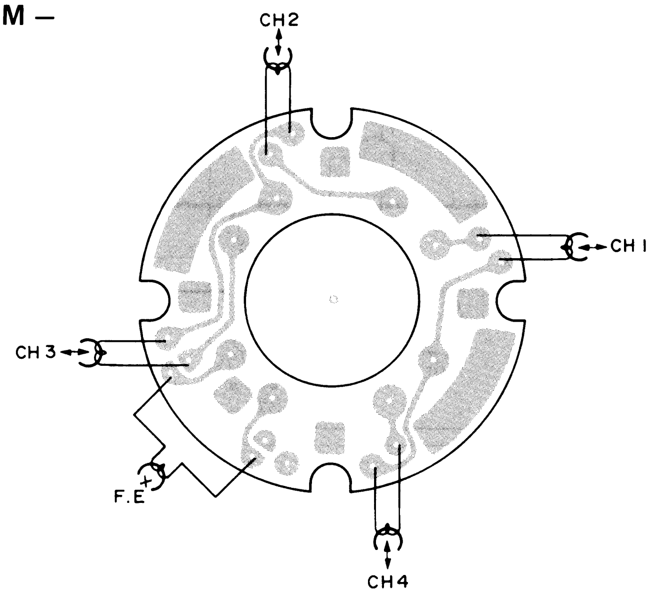
– Rear –


A
B
C
D
1
2
3
4
CN4
CN2
CN1
CN3
CN6
C1
C2
C5
C6
C7
C8
C9
C10
C11
R1
R2
R3
R4
R8
R9
R10
R11
S1
D. MDA PWB ASS'Y
YB20103B
D. MDA PWB
YB20103-01-01

– Front –

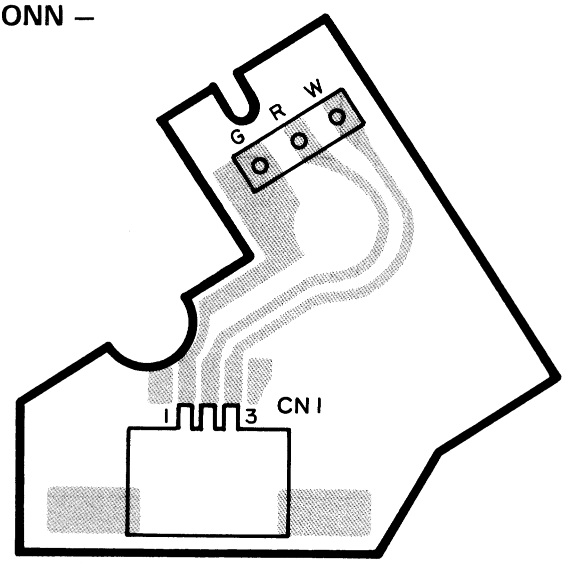

A
B
C
D
1
2
3
4
CN4
CN1
CN3
CN6
C3
C4
C6
C7
C8
C10
C11
D1
R5
R7
R11
D. MDA PWB ASS'Y
YB20103B
D. MDA PWB
YB20103-01-01

– UPPER DRUM –


CH2
CH1
CH3
F.E
CH4

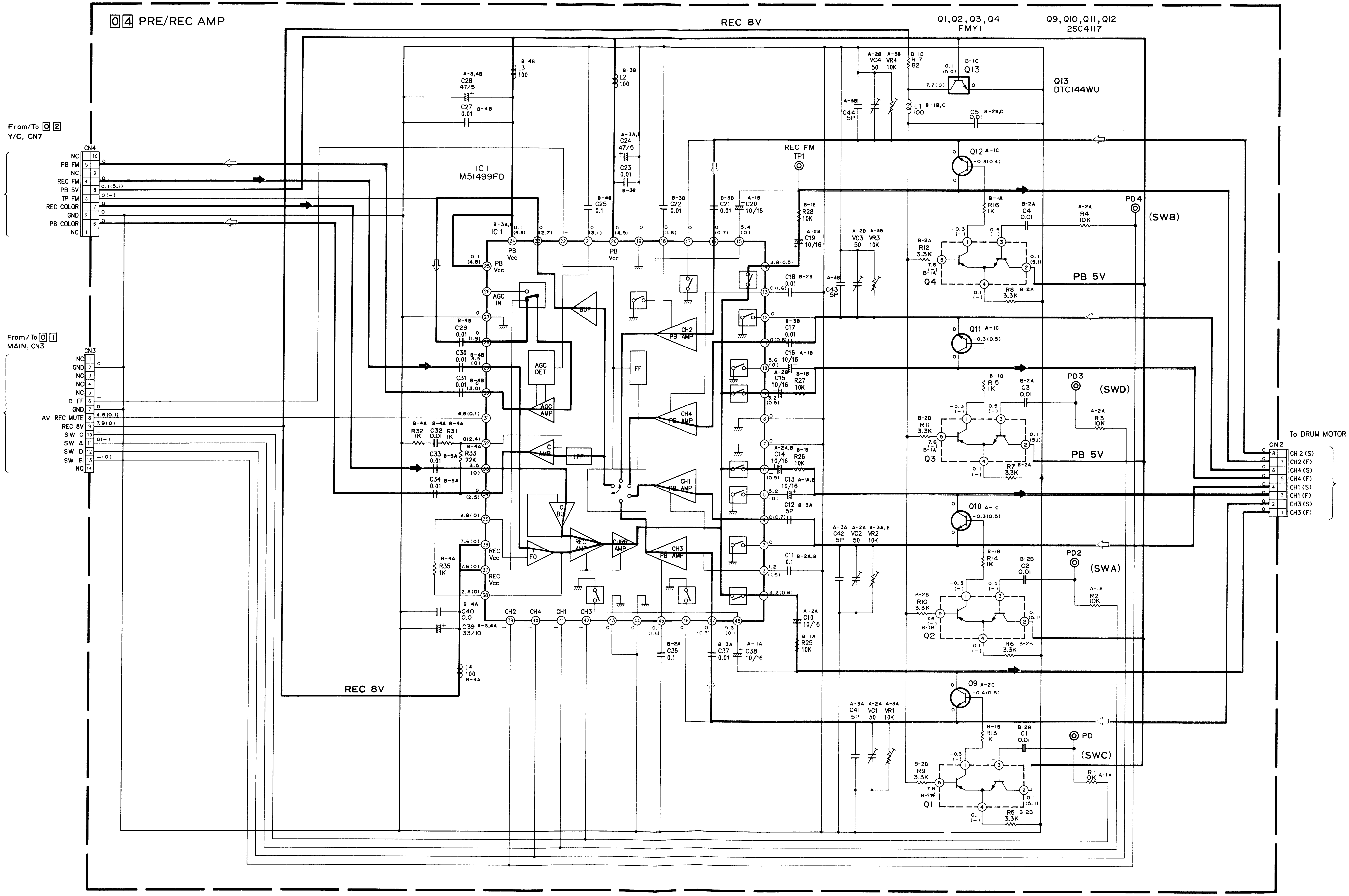
3 1 UPPER DRUM PWB
YDM3021-2

– FLY CONN –



0 9 FLY CONN PWB
YB30047

5.17 PRE/REC AMP SCHEMATIC DIAGRAM



04 PRE/REC AMP
REC 8V
Q1, Q2, Q3, Q4
FMY1
Q9, Q10, Q11, Q12
2SC4117
Q13
DTC144WU
From/To 02
Y/C, CN7
CN4
NC
PB FM
NC
REC FM
PB 5V
TP FM
REC COLOR
GND
PB COLOR
NC
From/To 01
MAIN, CN3
CN3
NC
GND
NC
NC
NC
D FF
GND
AV REC MUTE
REC 8V
SW C
SW A
SW D
SW B
NC
IC1
M51499FD
PB Vcc
AGC IN
BUF
AGC DET
AGC AMP
C AMP
LPF
FF
CH2 PB AMP
CH4 PB AMP
CH1 PB AMP
CH3 PB AMP
C BUF
EQ
REC AMP
CURR AMP
REC Vcc
REC FM
TP1
PB 5V
PD4
(SWB)
PD3
(SWD)
PD2
(SWA)
PD1
(SWC)
To DRUM MOTOR
CN2
CH2 (S)
CH2 (F)
CH4 (S)
CH4 (F)
CH1 (S)
CH1 (F)
CH3 (S)
CH3 (F)

SIGNAL PATH

- ⬅ REC
- ⇦ PB
- ⬅ REC & PB

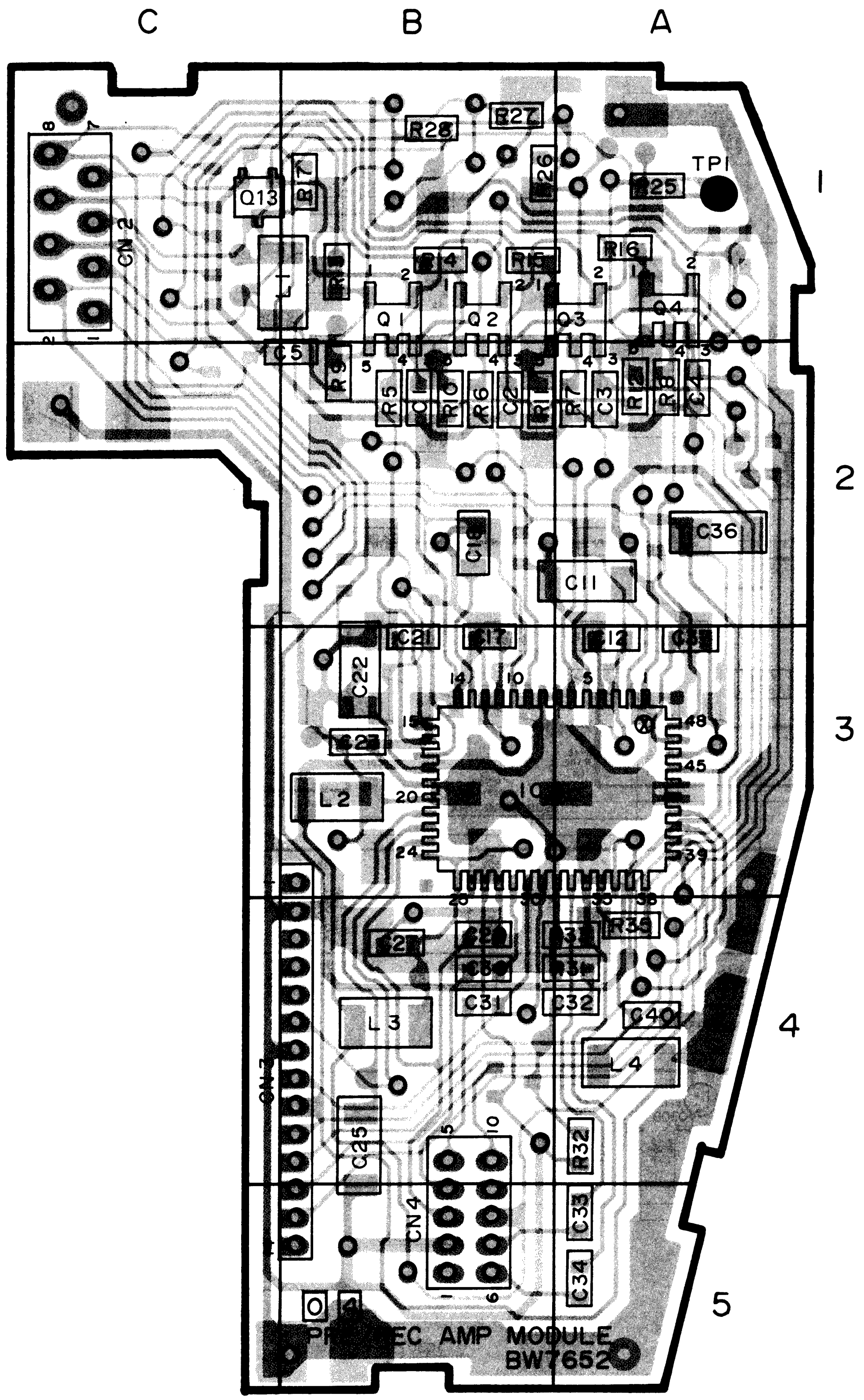
• Address of chip parts

A-1A
└ Address
└ A: Diserete parts side
B: Chip parts side

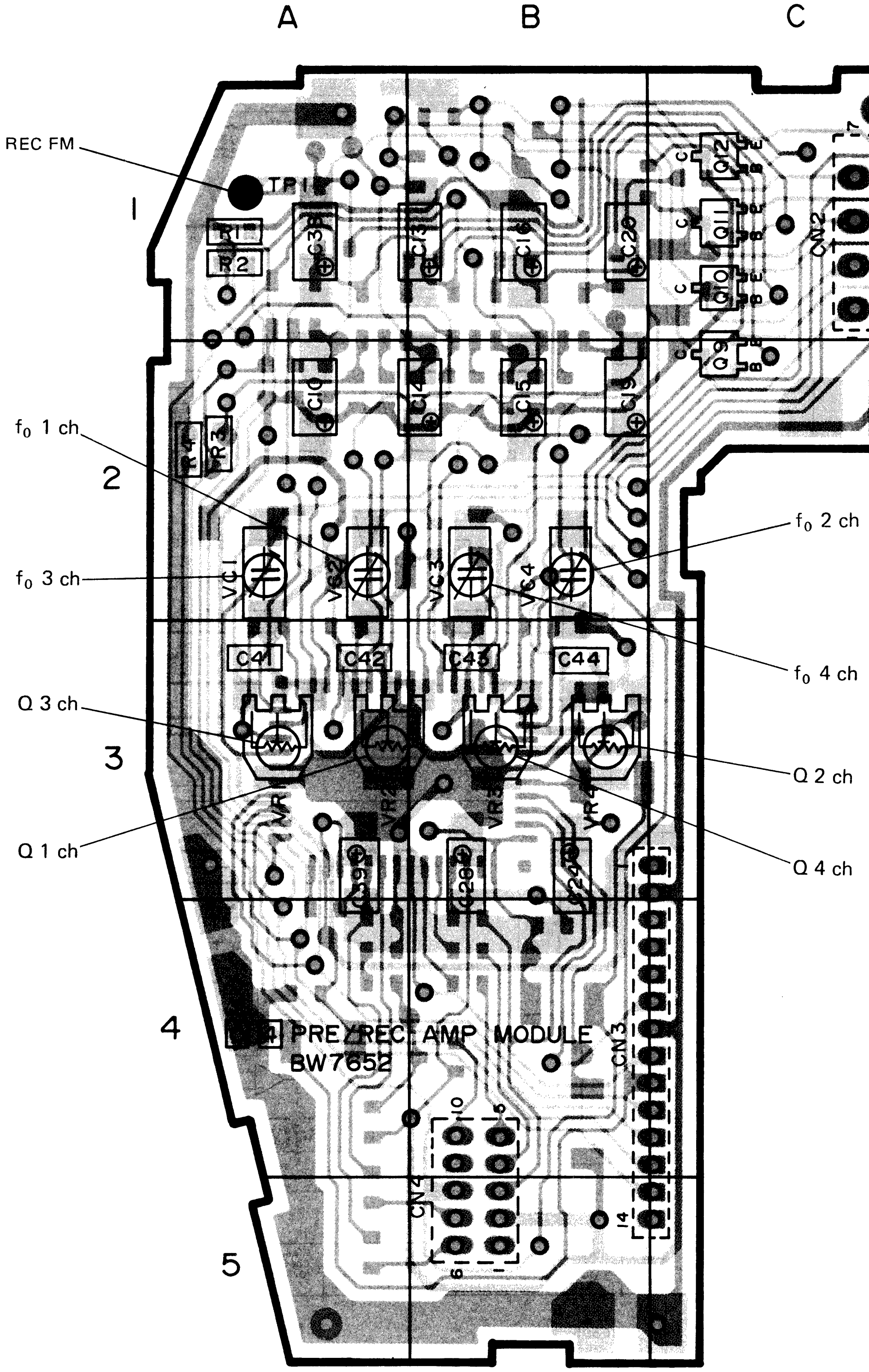
• Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

5.18 PRE/REC AMP CIRCUIT BOARD

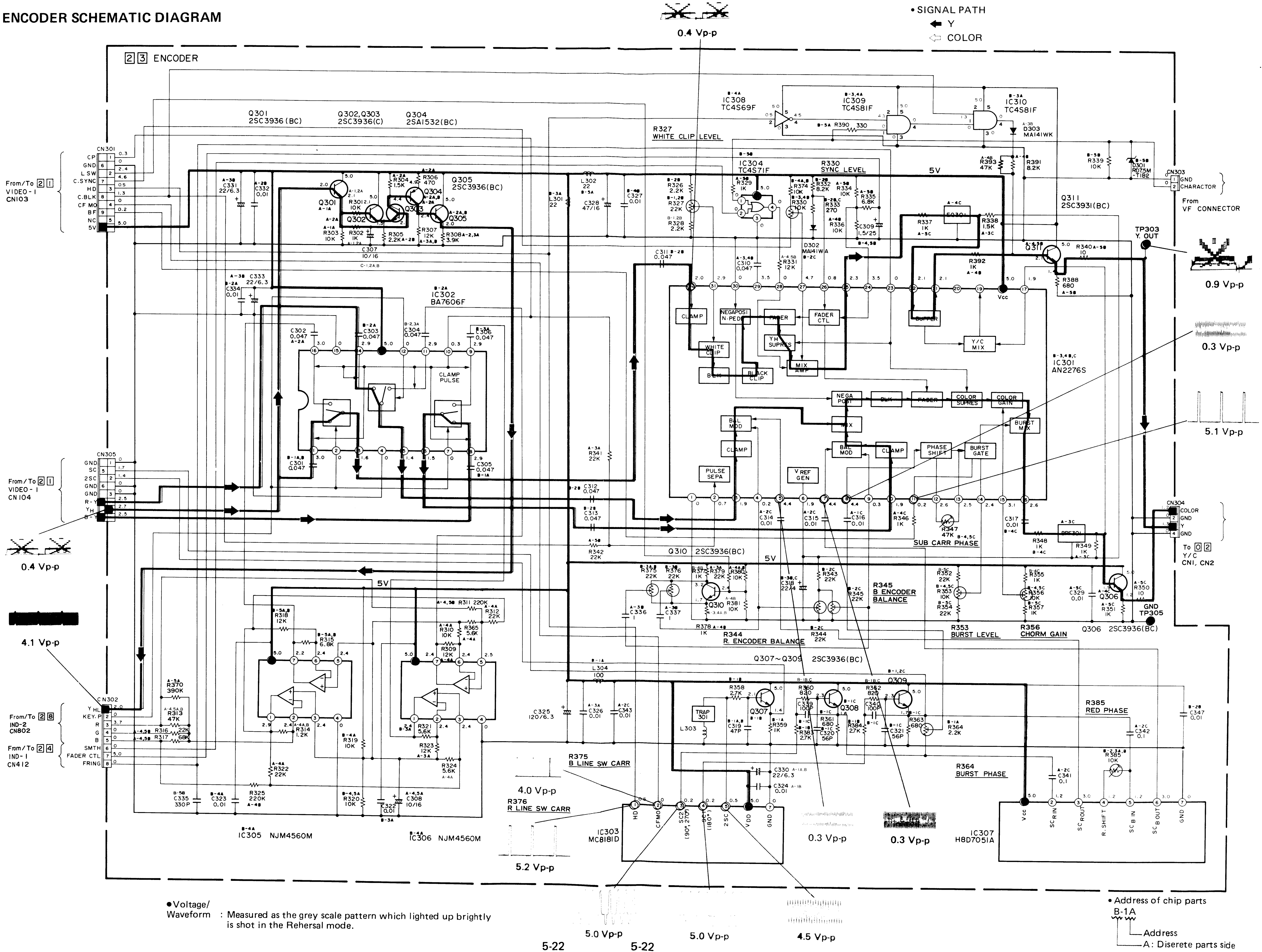
— Rear —


C
B
A
1
2
3
4
5
TP1
CN2
Q13
Q1
Q2
Q3
Q4
L1
L2
L3
L4
C11
C36
CN3
CN4
PRE/REC AMP MODULE
BW7652

— Front —


A
B
C
1
2
3
4
5
REC FM
TP1
f0 1 ch
f0 2 ch
f0 3 ch
f0 4 ch
Q 3 ch
Q 2 ch
Q 1 ch
Q 4 ch
VC1
VC2
VC3
VC4
VR1
VR2
VR3
VR4
C41
C42
C43
C44
CN2
CN3
CN4
PRE/REC AMP MODULE
BW7652

5.19 ENCODER SCHEMATIC DIAGRAM

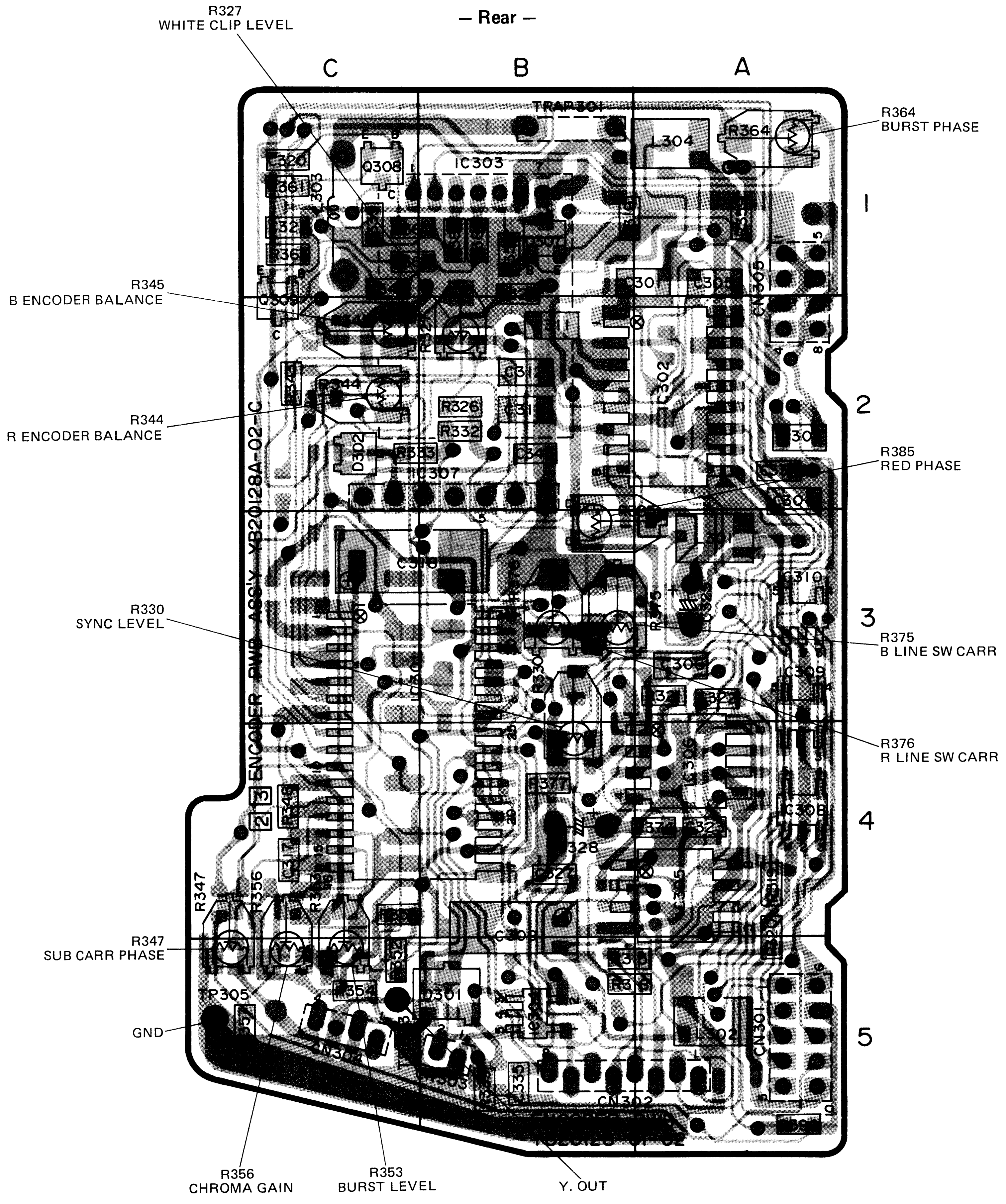


• SIGNAL PATH
Y
COLOR
2 3 ENCODER
Q301 2SC3936(BC)
Q302,Q303 2SC3936(C)
Q304 2SA1532(BC)
Q305 2SC3936(BC)
IC302 BA7606F
IC308 TC4S69F
IC309 TC4S81F
IC310 TC4S81F
D303 MA141WK
R327 WHITE CLIP LEVEL
IC304 TC4S71F
R330 SYNC LEVEL
D302 MA141WA
Q311 2SC3931(BC)
D301 RD7.5M -T1B2
CN303 GND CHARACTOR
From VF CONNECTOR
TP303 Y. OUT
0.9 Vp-p
0.3 Vp-p
IC301 AN2276S
5.1 Vp-p
CLAMP
NEGAPOSI N-PED
FADER
FADER CTL
WHITE CLIP
YH SUPRES
MIX AMP
BLK
BLACK CLIP
BUFFER
Y/C MIX
NEGA POSI
COLOR SUPRES
COLOR GAIN
BURST MIX
BAL MOD
PULSE SEPA
V REF GEN
PHASE SHIFT
BURST GATE
CLAMP PULSE
R347 SUB CARR PHASE
From/To 2 1 VIDEO-1 CN103
CN301 CP GND L SW C.SYNC HD C.BLK CF MO BF NC 5V
From/To 2 1 VIDEO-1 CN104
CN305 GND SC 2SC GND GND R-Y YH B-Y
0.4 Vp-p
4.1 Vp-p
From/To 2 8 IND-2 CN802
From/To 2 4 IND-1 CN412
CN302 Y HL KEY-P R G B SMTH FADER CTL FRING
CN304 COLOR GND Y GND
To 0 2 Y/C CN1, CN2
Q310 2SC3936(BC)
R345 B ENCODER BALANCE
R344 R. ENCODER BALANCE
R353 BURST LEVEL
R356 CHORM GAIN
Q306 2SC3936(BC)
GND TP305
Q307~Q309 2SC3936(BC)
R385 RED PHASE
R364 BURST PHASE
R375 B LINE SW CARR
R376 R LINE SW CARR
4.0 Vp-p
5.2 Vp-p
IC303 MC8181D
HD CFMO SC2 (90°,270°) SC1 (180°) 2SC VDD GND
IC307 H8D7051A
Vcc SC IN SC ROUT R. SHIFT SC B IN SC B OUT GND
0.3 Vp-p
0.3 Vp-p
IC305 NJM4560M
IC306 NJM4560M
TRAP 301
L303
5V
5.0 Vp-p
5.0 Vp-p
4.5 Vp-p

●Voltage/Waveform : Measured as the grey scale pattern which lighted up brightly is shot in the Rehersal mode.

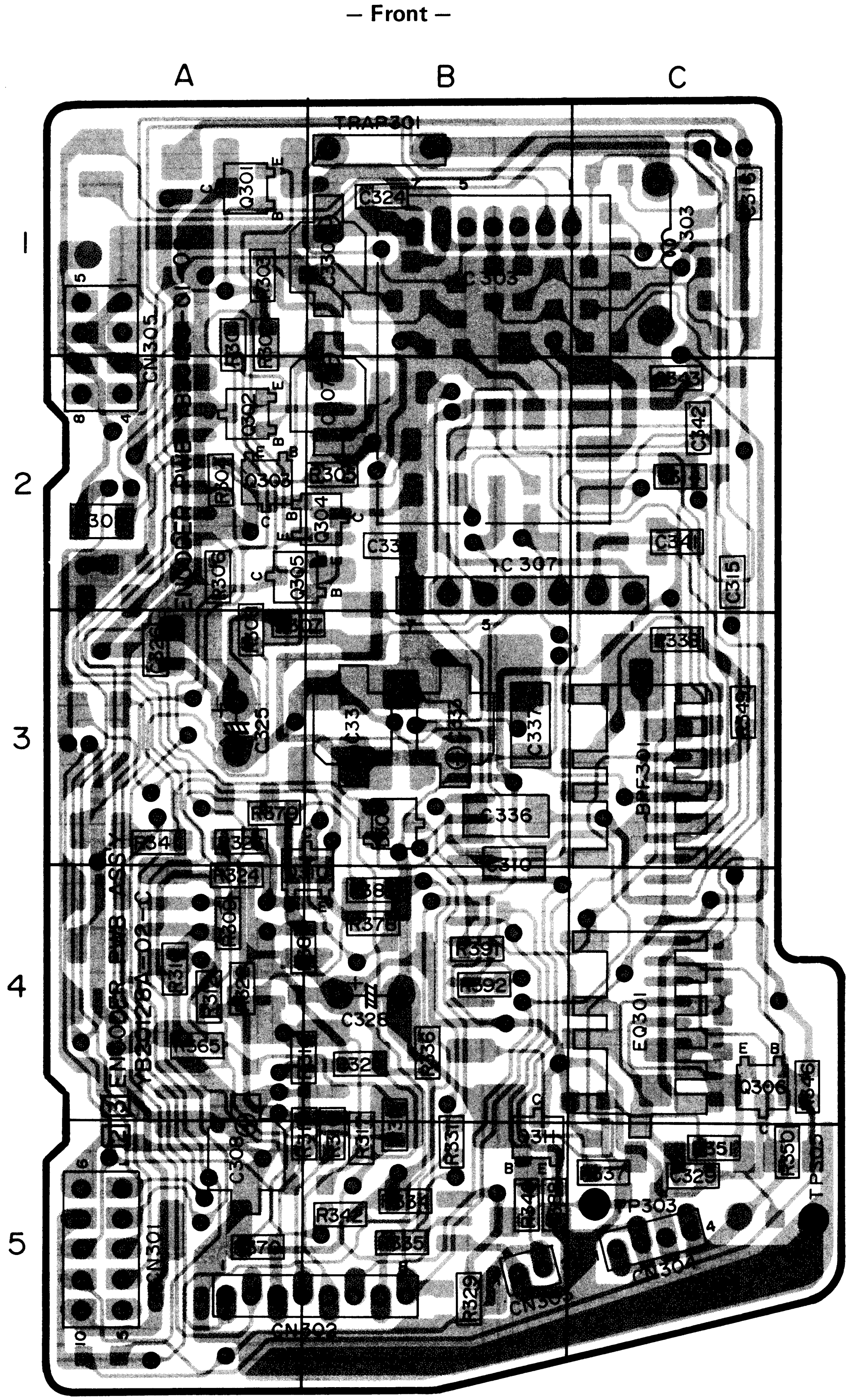
• Address of chip parts
B-1A
Address
A: Diserete parts side
B: Chip parts side

5.20 ENCODER CIRCUIT BOARD



— Rear —

R327
WHITE CLIP LEVEL
C
B
A
R364
BURST PHASE
R345
B ENCODER BALANCE
R344
R ENCODER BALANCE
R385
RED PHASE
R330
SYNC LEVEL
R375
B LINE SW CARR
R376
R LINE SW CARR
R347
SUB CARR PHASE
GND
R356
CHROMA GAIN
R353
BURST LEVEL
Y. OUT
1
2
3
4
5
ENCODER PWB ASS'Y VB20128A-02-C



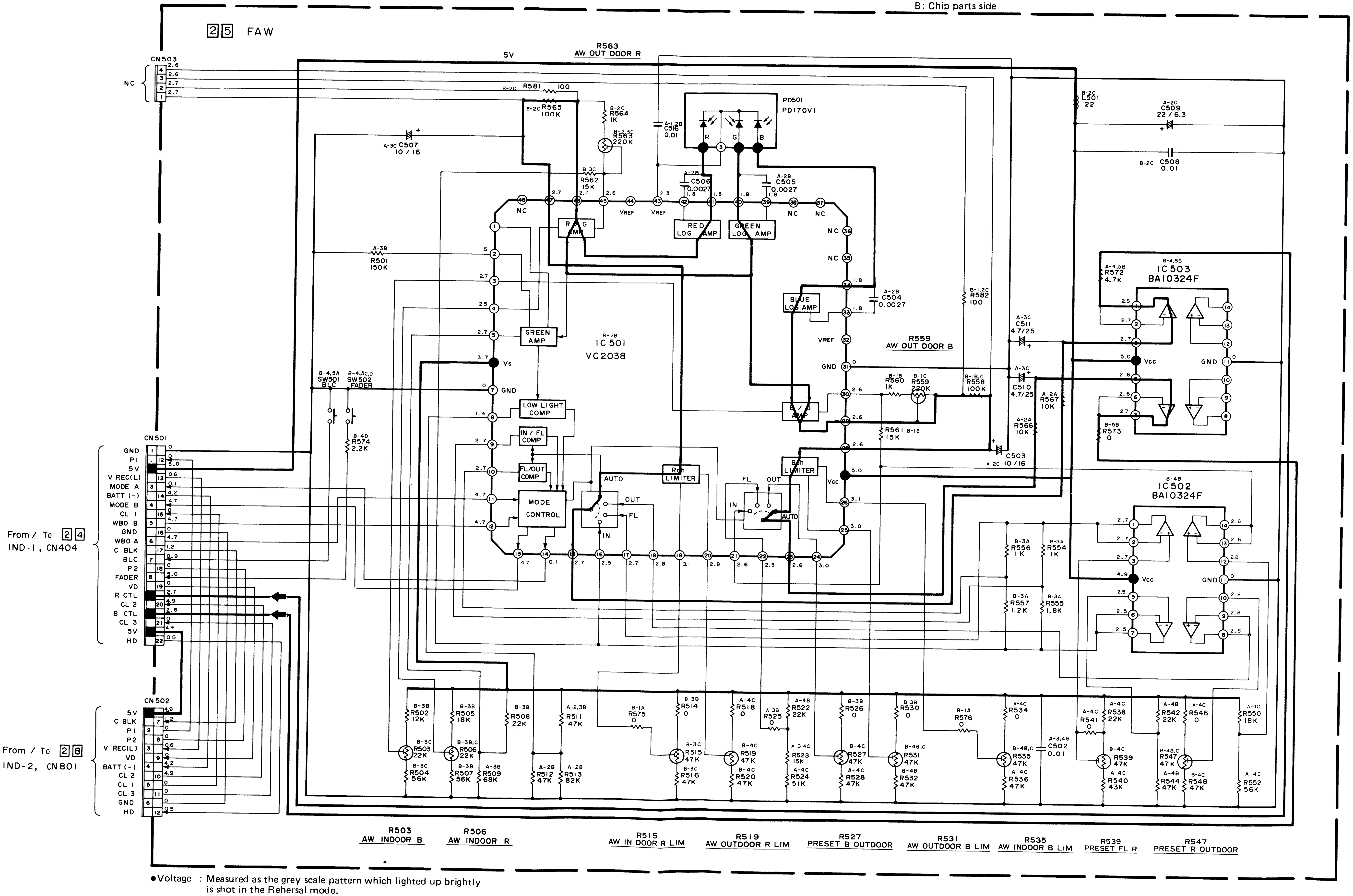
— Front —

A
B
C
1
2
3
4
5
ENCODER PWB ASS'Y VB20128A-02-C

5.21 FAW SCHEMATIC DIAGRAM

- Address of chip parts
  A-2C
  Address
  A: Diserete parts side
  B: Chip parts side

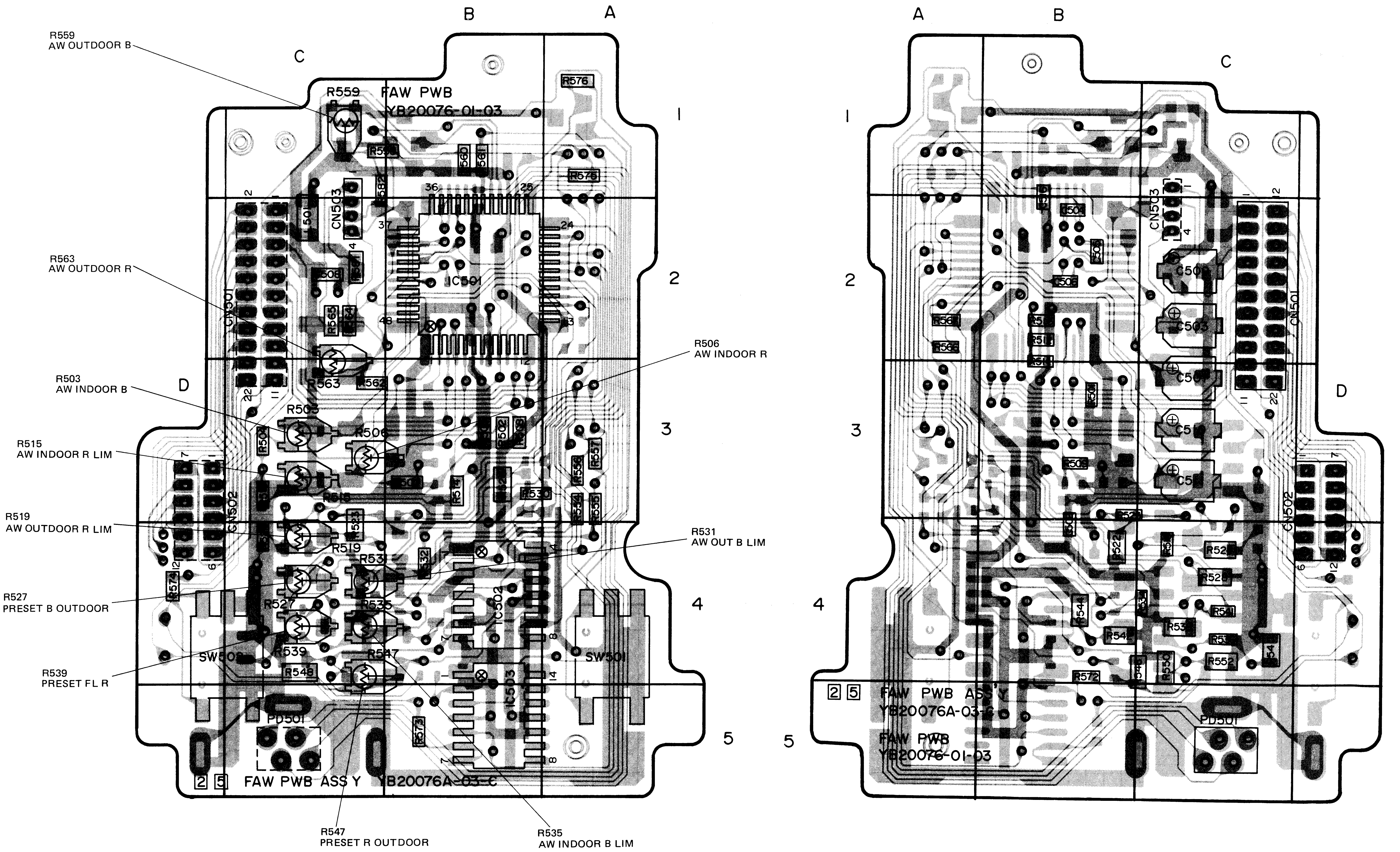
◀ FAW SIGNAL PATH



25 FAW
CN503
NC
5V
R563 AW OUT DOOR R
R581 100
R565 100K
R564 1K
R563 220K
C507 10 / 16
C516 0.01
PD501 PD170V1
R G B
C506 0.0027
C505 0.0027
R562 15K
L501 22
C509 22 / 6.3
C508 0.01
NC
VREF
RED LOG AMP
GREEN LOG AMP
R/G AMP
R501 150K
GREEN AMP
IC501 VC2038
BLUE LOG AMP
C504 0.0027
R582 100
Vs
GND
VREF
R559 AW OUT DOOR B
C511 4.7/25
C510 4.7/25
R560 1K
R559 220K
R558 100K
R567 10K
R566 10K
R561 15K
C503 10/16
SW501 BLC
SW502 FADER
R574 2.2K
LOW LIGHT COMP
IN / FL COMP
FL/OUT COMP
MODE CONTROL
AUTO
OUT
FL
IN
R/B LIMITER
B/G LIMITER
Vcc
B/G AMP
IC503 BA10324F
R572 4.7K
R573 0
IC502 BA10324F
Vcc
GND
R556 1K
R554 1K
R557 1.2K
R555 1.8K
CN501
GND
P1
5V
V REC(L)
MODE A
BATT (-)
MODE B
CL 1
WBO B
GND
WBO A
C BLK
BLC
P2
FADER
VD
R CTL
CL 2
B CTL
CL 3
5V
HD
From / To 24 IND-1, CN404
CN502
5V
C BLK
P1
P2
V REC(L)
VD
BATT (-)
CL 2
CL 1
CL 3
GND
HD
From / To 28 IND-2, CN801
R502 12K
R503 22K
R504 56K
R505 18K
R506 22K
R507 56K
R508 22K
R509 68K
R511 47K
R512 47K
R513 82K
R575 0
R514 0
R515 47K
R516 47K
R518 0
R519 47K
R520 47K
R525 0
R522 22K
R523 15K
R524 51K
R526 0
R527 47K
R528 47K
R530 0
R531 47K
R532 47K
R576 0
R534 0
R535 47K
R536 47K
C502 0.01
R541 0
R538 22K
R539 47K
R540 43K
R542 22K
R546 0
R547 47K
R544 47K
R548 47K
R550 18K
R552 56K
R503 AW INDOOR B
R506 AW INDOOR R
R515 AW IN DOOR R LIM
R519 AW OUTDOOR R LIM
R527 PRESET B OUTDOOR
R531 AW OUTDOOR B LIM
R535 AW INDOOR B LIM
R539 PRESET FL R
R547 PRESET R OUTDOOR

- Voltage : Measured as the grey scale pattern which lighted up brightly is shot in the Rehersal mode.

5.22 FAW CIRCUIT BOARD



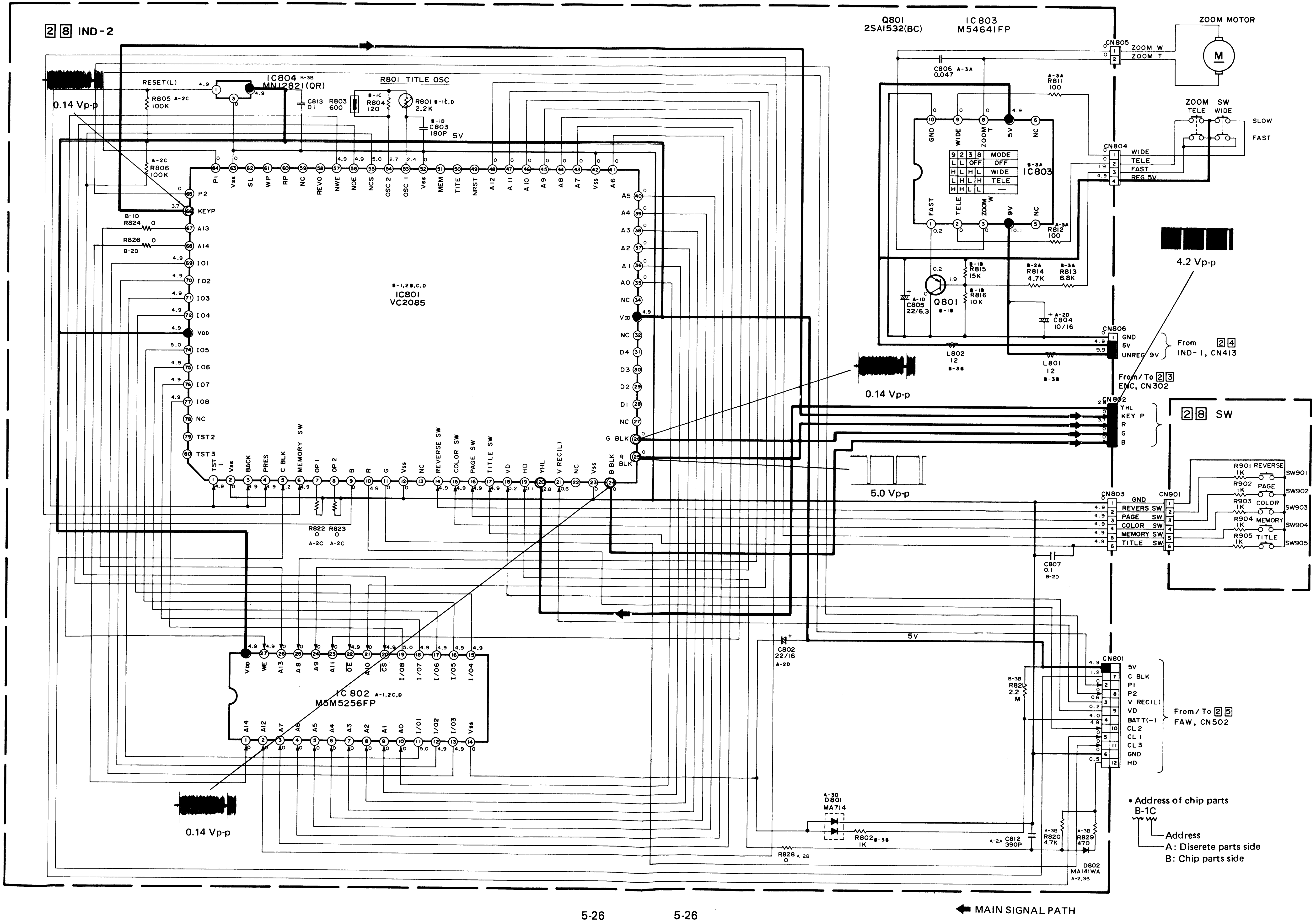
— Rear —

— Front —

R559
AW OUTDOOR B
R563
AW OUTDOOR R
R503
AW INDOOR B
R515
AW INDOOR R LIM
R519
AW OUTDOOR R LIM
R527
PRESET B OUTDOOR
R539
PRESET FL R
R547
PRESET R OUTDOOR
R535
AW INDOOR B LIM
R531
AW OUT B LIM
R506
AW INDOOR R
FAW PWB
YB20076-01-03
FAW PWB ASS'Y YB20076A-03-C
IC501
IC502
IC503
CN501
CN502
CN503
SW501
SW502
PD501
A
B
C
D
1
2
3
4
5

5.23 INDICATOR-2 & SWITCH SCHEMATIC DIAGRAM

●Voltage/
Waveform : Measured as the grey scale pattern which lighted up brightly is shot in the Rehersal mode.

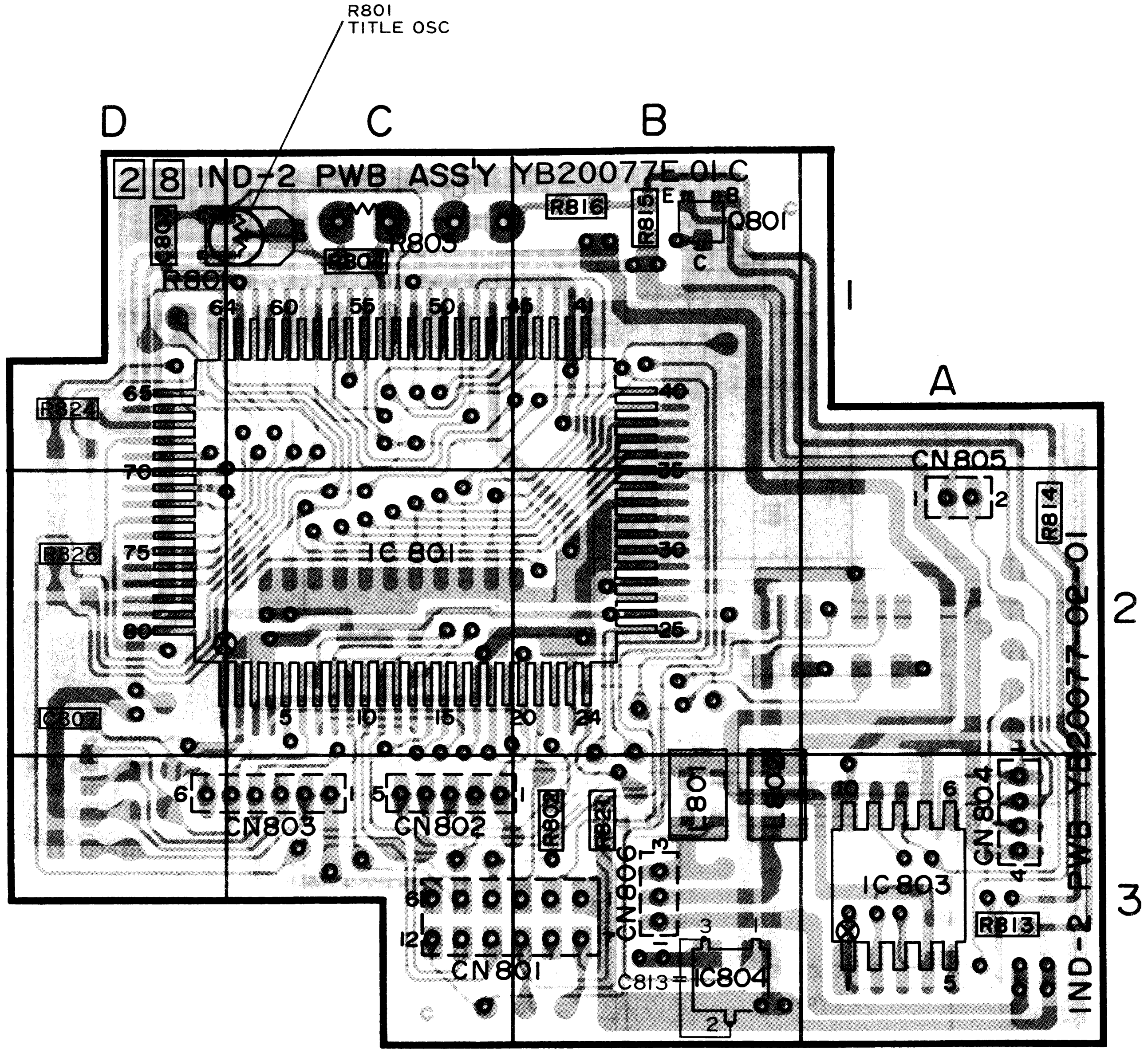


28 IND-2
28 SW
IC801 VC2085
IC802 M5M5256FP
IC803 M54641FP
IC804 MN12821(QR)
Q801 2SA1532(BC)
R801 TITLE OSC
RESET(L)
0.14 Vp-p
0.14 Vp-p
0.14 Vp-p
4.2 Vp-p
5.0 Vp-p
ZOOM MOTOR
ZOOM SW
TELE
WIDE
SLOW
FAST
CN805
ZOOM W
ZOOM T
CN804
WIDE
TELE
FAST
REG 5V
CN806
GND
5V
UNREG 9V
From 24 IND-1, CN413
From/To 23 ENC, CN302
CN802
YHL
KEY P
R
G
B
CN803
CN901
GND
REVERS SW
PAGE SW
COLOR SW
MEMORY SW
TITLE SW
R901 REVERSE
R902 PAGE
R903 COLOR
R904 MEMORY
R905 TITLE
SW901
SW902
SW903
SW904
SW905
CN801
5V
C BLK
P1
P2
V REC(L)
VD
BATT(−)
CL 2
CL 1
CL 3
GND
HD
From/To 25 FAW, CN502
D801 MA714
D802 MA141WA
MODE
OFF
WIDE
TELE
5V
MAIN SIGNAL PATH

- Address of chip parts
B-1C
Address
A: Diserete parts side
B: Chip parts side

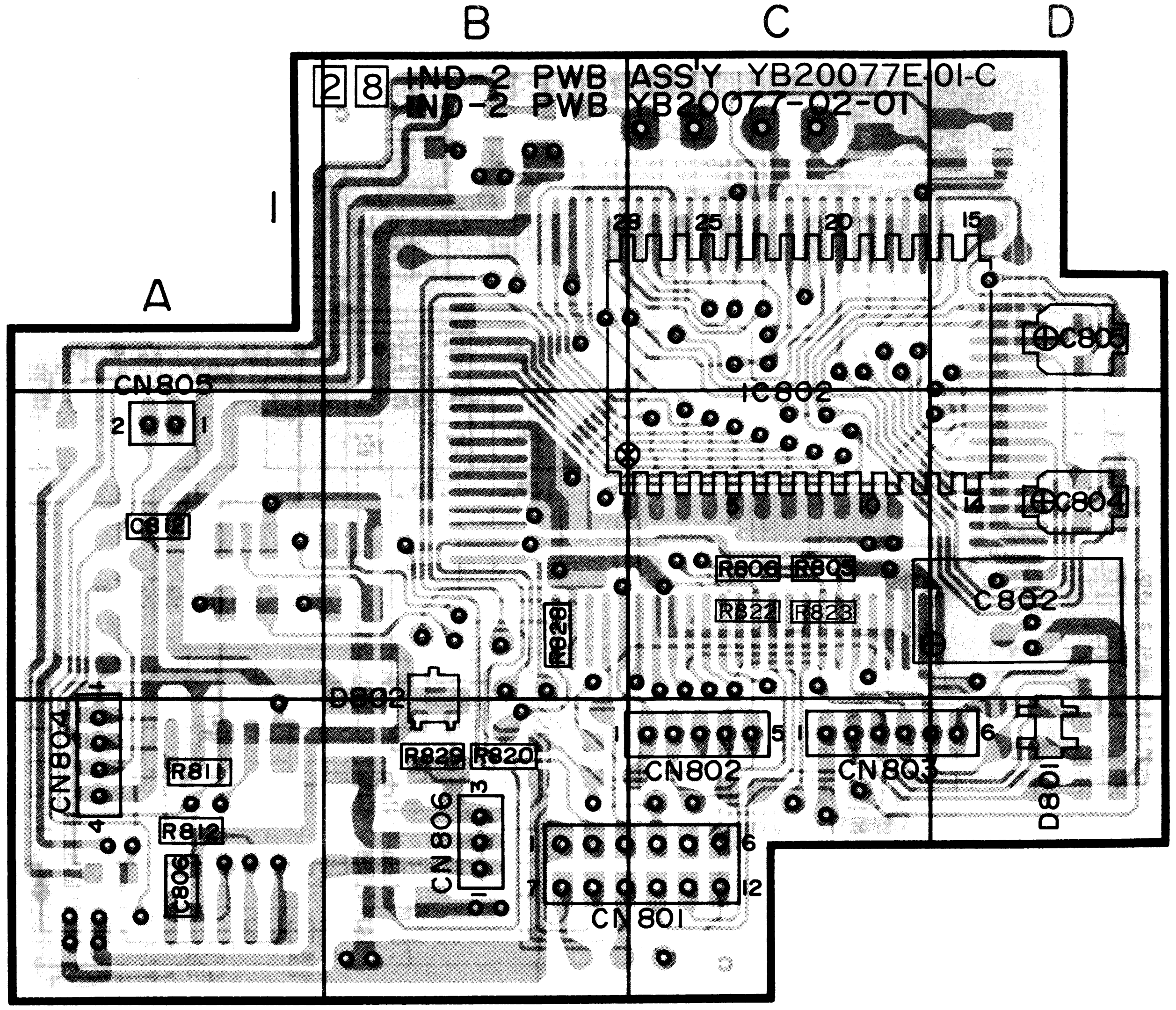
5.24 INDICATOR-2 CIRCUIT BOARD

— Rear —

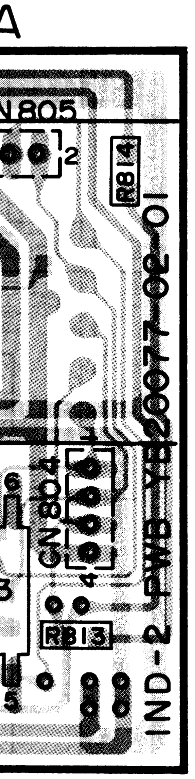

R801
TITLE OSC
D
C
B
A
1
2
3
2 8 IND-2 PWB ASS'Y YB20077E-01-C
IND-2 PWB YB20077-02-01
R816
R815
Q801
E
B
C
R803
R802
R804
R805
64
60
55
50
45
41
65
70
75
80
40
35
30
25
5
10
15
20
24
IC801
R824
R825
C807
CN805
R814
CN803
CN802
CN801
CN806
C801
R807
R823
IC803
IC804
C813
CN804
R813

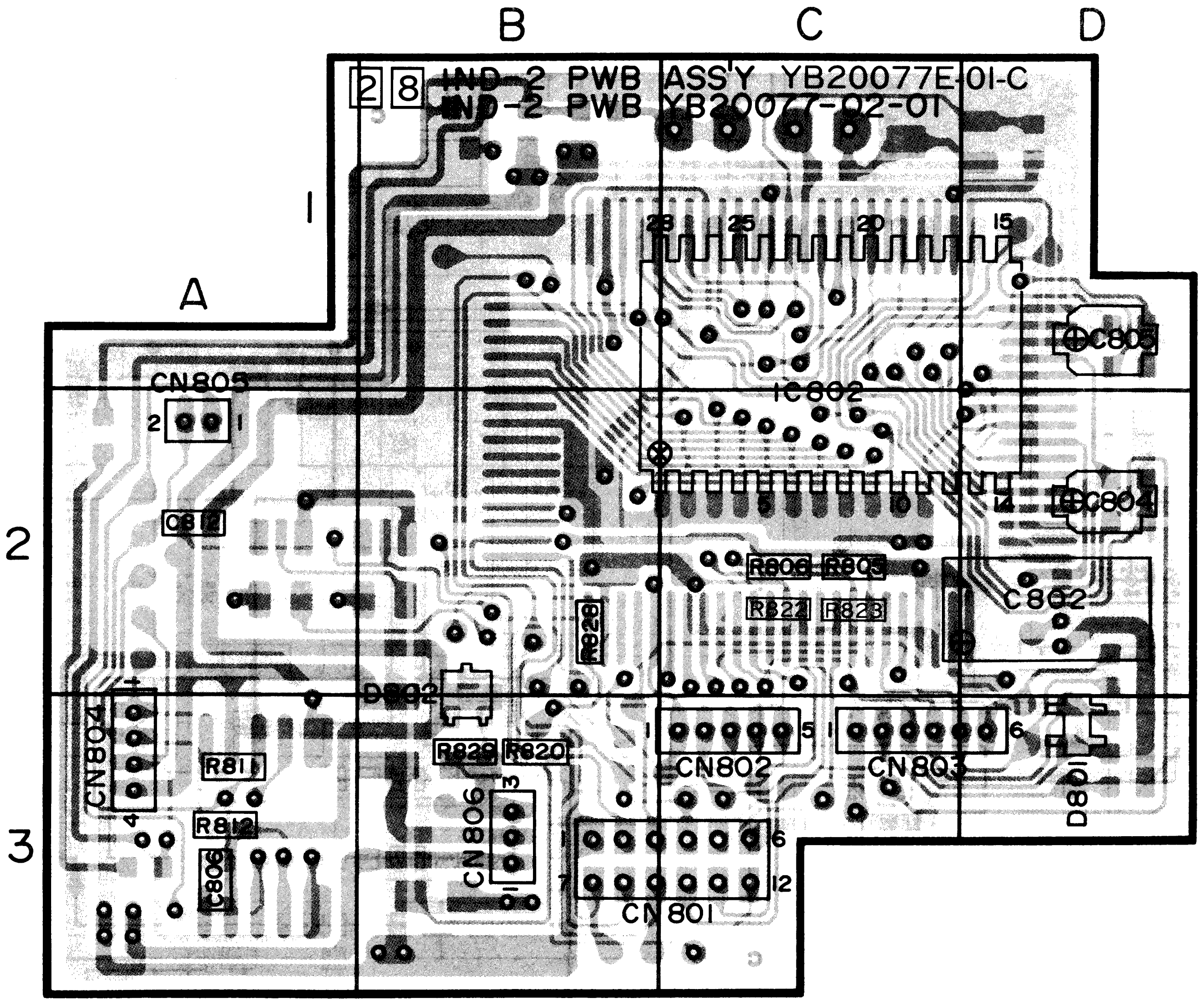
5.25 SWIT

— Front —

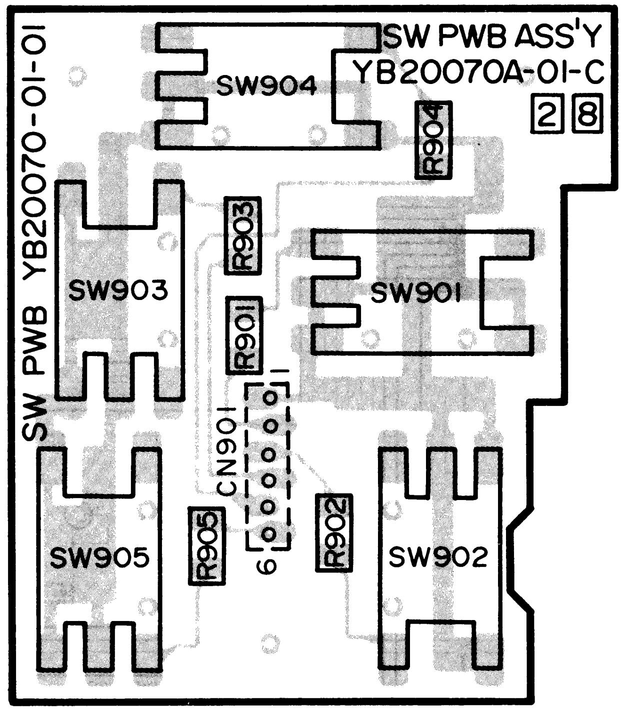

B
C
D
A
1
2
3
2 8 IND-2 PWB ASS'Y YB20077E-01-C
IND-2 PWB YB20077-02-01
28
25
20
15
14
IC802
C805
C804
C802
CN805
C812
R806
R809
R822
R823
R828
D802
R829
R820
R811
R812
C806
CN804
CN806
CN802
CN803
CN801
D801

— Front —


A
CN805
R814
2
3
IND-2 PWB YB20077-02-01
CN804
R813

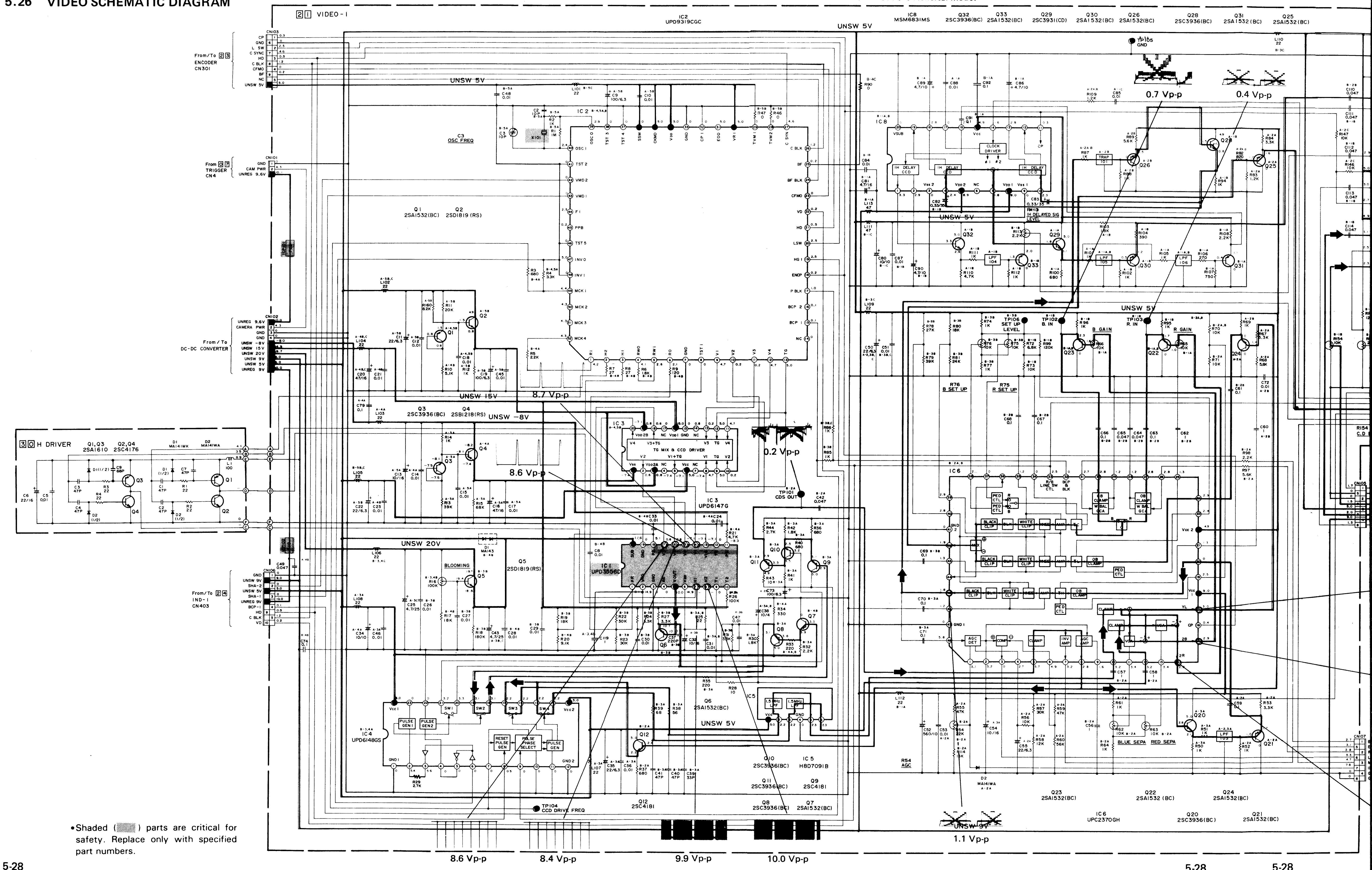

B
C
D
1
A
2
3
2 8
IND-2 PWB ASS'Y YB20077E-01-C
IND-2 PWB YB20077-02-01
28
25
20
15
14
IC802
IC803
IC804
C802
CN805
C812
R806
R805
R822
R823
R826
D802
R828
R820
CN804
R811
R812
C806
CN806
CN801
CN802
CN803
D801

5.25 SWITCH CIRCUIT BOARD


SW PWB ASS'Y
YB20070A-01-C
2 8
SW PWB YB20070-01-01
SW904
R904
SW903
R903
SW901
R901
CN901
1
6
R905
R902
SW905
SW902

5.26 VIDEO SCHEMATIC DIAGRAM

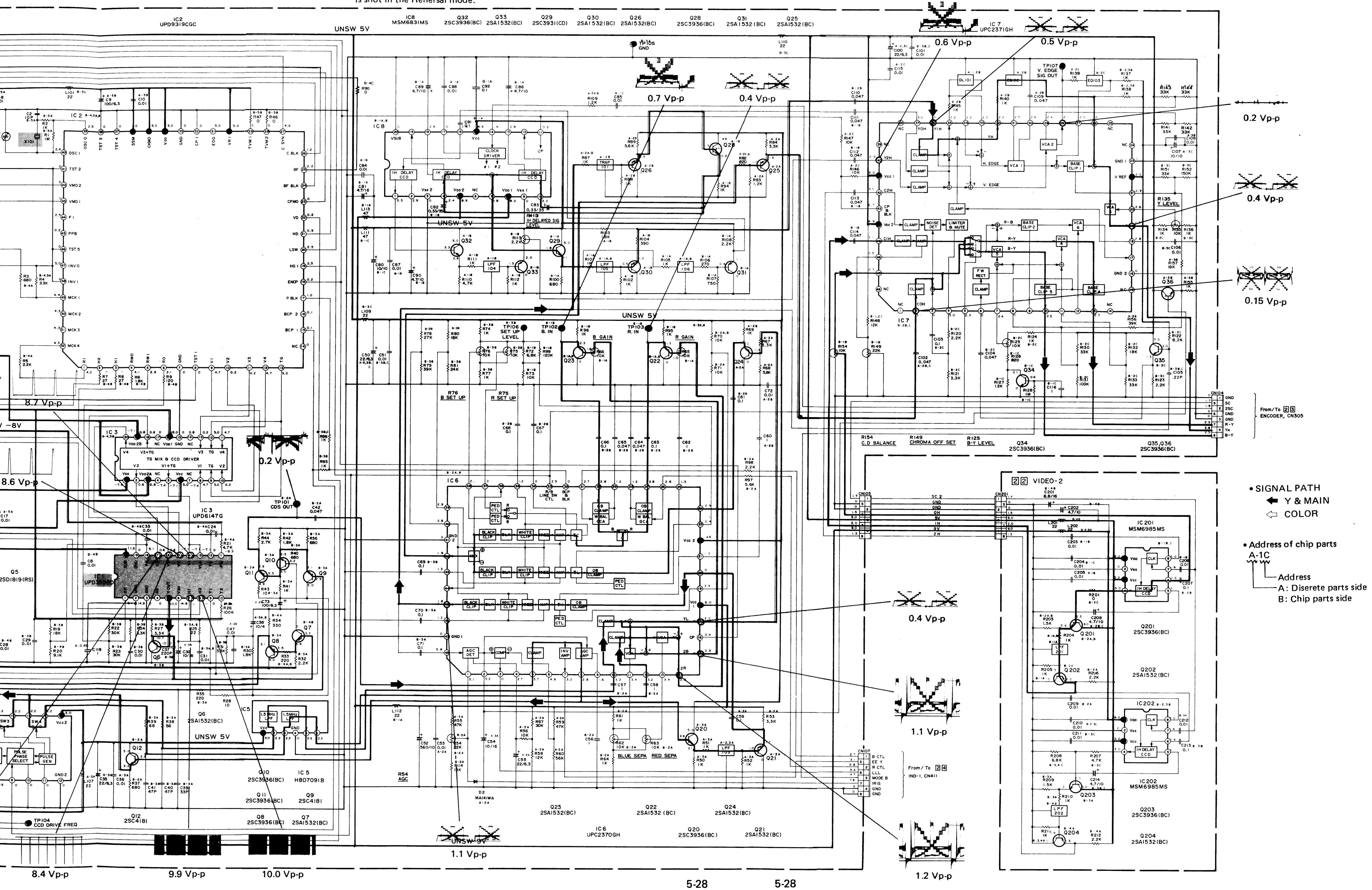
•Voltage/ Waveform : Measured as the grey scale pattern which lighted up brightly is shot in the Rehersal mode.



21 VIDEO-1
From/To 23 ENCODER CN301
CN103
CP
GND
L SW
C SYNC
HD
C BLK
CFMO
BF
NC
UNSW 5V
From Q7 TRIGGER CN4
CN101
GND
CAM PWR
UNREG 9.6V
From/To DC-DC CONVERTER
CN102
UNREG 9.6V
CAMERA PWR
GND
GND
UNSW -8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
UNREG 9V
From/To 24 IND-1 CN403
CN106
GND
UNSW 9V
SHA-2
UNSW 5V
SHA-1
UNREG 9V
BCP-1
HD
C BLK
VD
30 H DRIVER
Q1,Q3 2SA1610
Q2,Q4 2SC4176
D1 MA141WK
D2 MA141WA
IC2 UPD9319CGC
X101
C3 OSC FREQ
Q1 2SA1532(BC)
Q2 2SD1819(RS)
Q3 2SC3936(BC)
Q4 2SB1218(RS)
UNSW 5V
UNSW 15V
UNSW -8V
UNSW 20V
8.7 Vp-p
8.6 Vp-p
IC3 UPD6147G
TG MIX & CCD DRIVER
0.2 Vp-p
TP101 CDS OUT
IC1 UPD3556D
BLOOMING
Q5 2SD1819(RS)
D1 MA143
IC4 UPD6148GS
PULSE GEN1
PULSE GEN2
RESET PULSE GEN
PULSE PHASE SELECT
PULSE GEN
SW1
SW2
SW3
SW4
IC5
1.5MHz LPF
Q6 2SA1532(BC)
Q12 2SC4181
Q10 2SC3936(BC)
Q11 2SC3936(BC)
IC5 H8D7091B
Q9 2SC4181
Q8 2SC3936(BC)
Q7 2SA1532(BC)
TP104 CCD DRIVE FREQ
8.6 Vp-p
8.4 Vp-p
9.9 Vp-p
10.0 Vp-p
IC8 MSM6831MS
Q32 2SC3936(BC)
Q33 2SA1532(BC)
Q29 2SC3931(CD)
Q30 2SA1532(BC)
Q26 2SA1532(BC)
Q28 2SC3936(BC)
Q31 2SA1532(BC)
Q25 2SA1532(BC)
TP105 GND
0.7 Vp-p
0.4 Vp-p
1H DELAY CCD
CLOCK DRIVER
RH101 1H DELAYED SIG LEVEL
TRAP 101
LPF 104
LPF 105
LPF 106
TP106 SET UP LEVEL
TP102 B.IN
TP103 R.IN
B GAIN
R GAIN
R76 B SET UP
R75 R SET UP
IC6
PED CTL
BLACK CLIP
WHITE CLIP
OB CLAMP
W BAL GCA
MIX
AGC DET
COMP
CLAMP
INV AMP
AGC AMP
GCA
VCA
R/B LINE SW CTL
BCP B BLK
R54 AGC
R61
BLUE SEPA
RED SEPA
LPF 103
Q20
Q21
D2 MA141WA
UNSW 9V
1.1 Vp-p
Q23 2SA1532(BC)
Q22 2SA1532 (BC)
Q24 2SA1532(BC)
IC6 UPC2370GH
Q20 2SC3936(BC)
Q21 2SA1532(BC)
CN107
R154 C.D
CN105

•Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

•Voltage/ Waveform : Measured as the grey scale pattern which lighted up brightly is shot in the Rehersal mode.

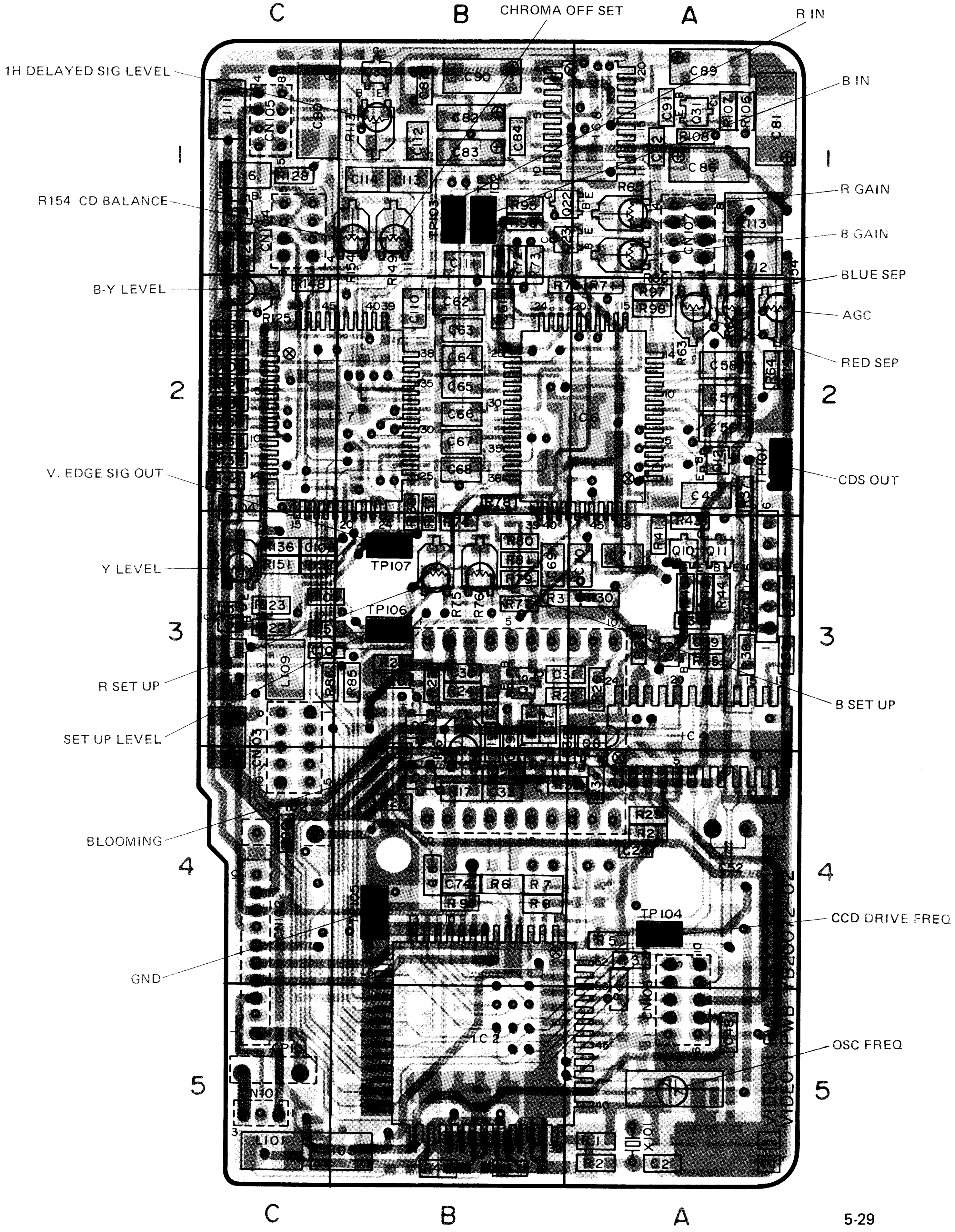

IC2
UPD9319CGC
UNSW 5V
IC8
MSM6831MS
Q32
2SC3936(BC)
Q33
2SA1532(BC)
Q29
2SC3931(CD)
Q30
2SA1532(BC)
Q26
2SA1532(BC)
Q28
2SC3936(BC)
Q31
2SA1532(BC)
Q25
2SA1532(BC)
IC 7
UPC2371GH
0.6 Vp-p
0.5 Vp-p
0.7 Vp-p
0.4 Vp-p
0.2 Vp-p
0.4 Vp-p
0.15 Vp-p
TP105
GND
TP107
V. EDGE
SIG OUT
CLOCK DRIVER
1H DELAY CCD
1H DELAYED SIG LEVEL
TP106
SET UP LEVEL
TP102
B. IN
TP103
R. IN
B GAIN
R GAIN
R76
B SET UP
R75
R SET UP
R154
C.D BALANCE
R149
CHROMA OFF SET
R125
B-Y LEVEL
R135
Y LEVEL
Q34
2SC3936(BC)
Q35,Q36
2SC3936(BC)
CN104
From/To 25
ENCODER, CN305
8.7 Vp-p
8.6 Vp-p
0.2 Vp-p
IC 3
TG MIX & CCD DRIVER
TP101
CDS OUT
IC 3
UPD6147G
IC 1
Q5
2SD1819(RS)
IC 6
UPC2370GH
0.4 Vp-p
1.1 Vp-p
1.2 Vp-p
1.1 Vp-p
BLUE SEPA
RED SEPA
R54
AGC
D2
MA141WA
Q23
2SA1532(BC)
Q22
2SA1532 (BC)
Q24
2SA1532(BC)
Q20
2SC3936(BC)
Q21
2SA1532(BC)
CN107
From/To 24
IND-1, CN411
CN105
22 VIDEO-2
CN201
IC 201
MSM6985MS
Q201
2SC3936(BC)
Q202
2SA1532(BC)
IC202
MSM6985MS
Q203
2SC3936(BC)
Q204
2SA1532(BC)
IC5
Q6
2SA1532(BC)
UNSW 5V
Q10
2SC3936(BC)
IC 5
HD70918
Q11
2SC3936(BC)
Q9
2SC4181
Q8
2SC3936(BC)
Q7
2SA1532(BC)
Q12
2SC4181
TP104
CCD DRIVE FREQ
PULSE SELECT
PULSE GEN
UNSW 9V
8.4 Vp-p
9.9 Vp-p
10.0 Vp-p

• SIGNAL PATH
- ⬅ Y & MAIN
- ⇦ COLOR

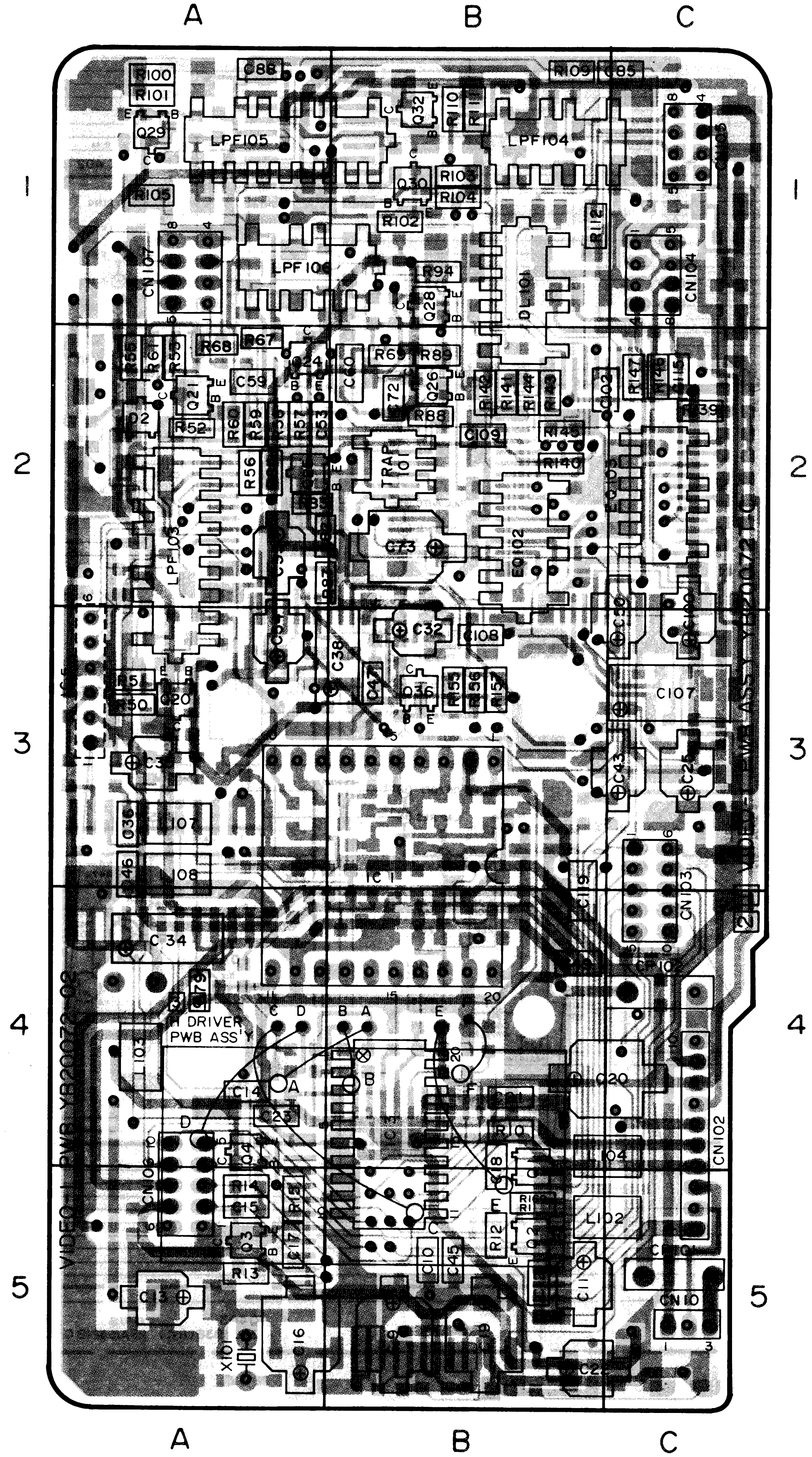
• Address of chip parts
A-1C
- Address
- A: Diserete parts side
- B: Chip parts side

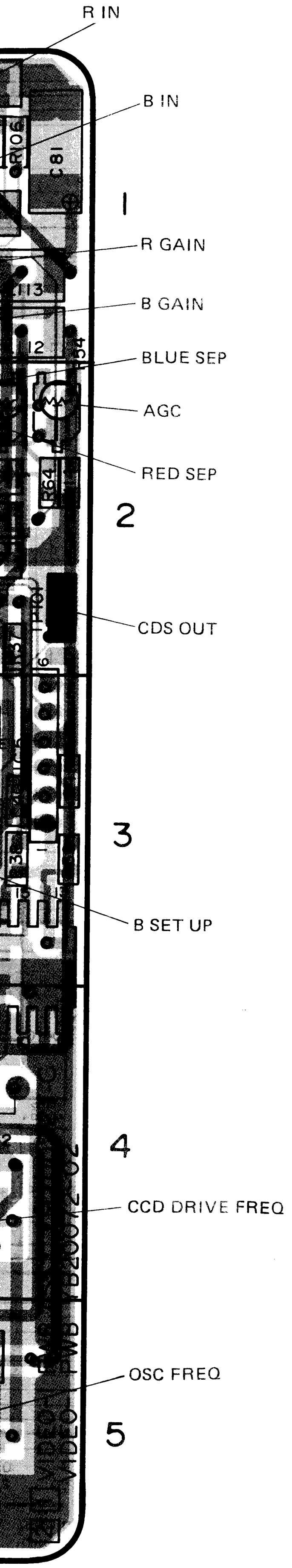
5.27 VIDEO-1 CIRCUIT BOARD

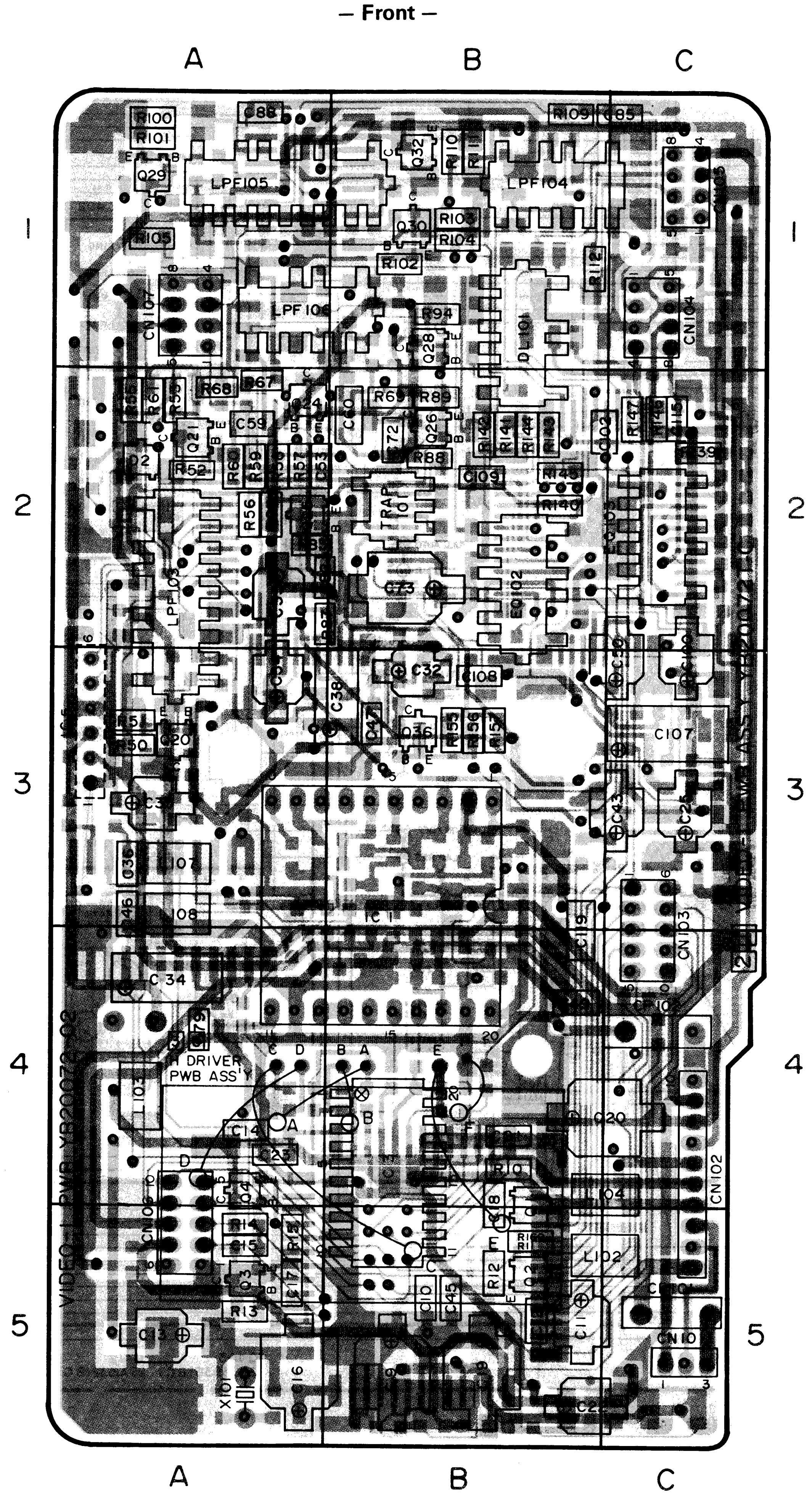
— Rear —


C
B
A
CHROMA OFF SET
R IN
1H DELAYED SIG LEVEL
B IN
R154 CD BALANCE
R GAIN
B GAIN
B-Y LEVEL
BLUE SEP
AGC
RED SEP
V. EDGE SIG OUT
CDS OUT
Y LEVEL
TP107
TP106
R SET UP
B SET UP
SET UP LEVEL
BLOOMING
CCD DRIVE FREQ
TP104
GND
OSC FREQ
1
2
3
4
5

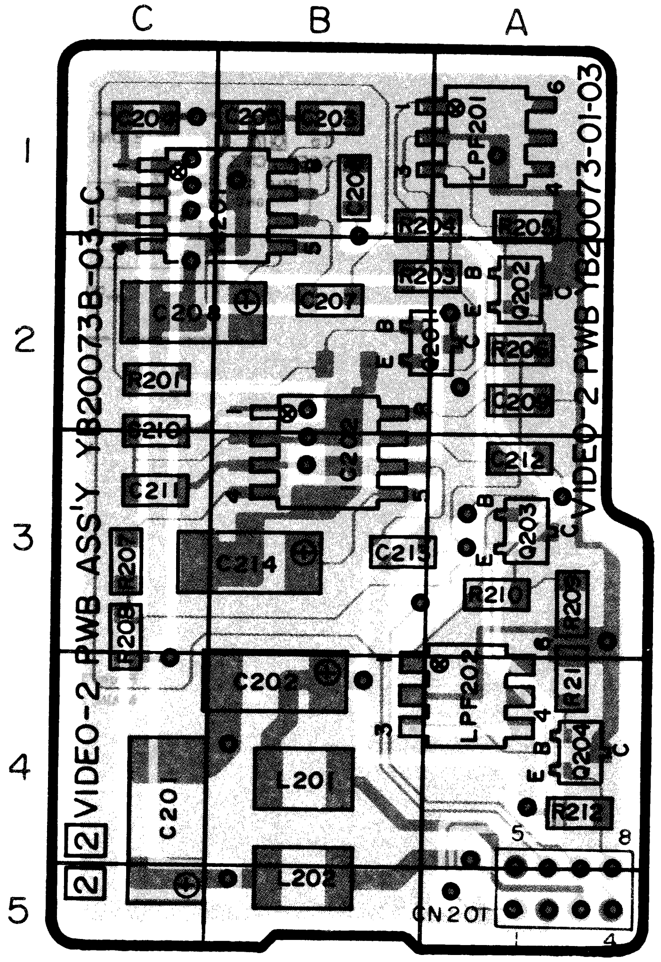
— Front —


A
B
C
LPF105
LPF104
LPF103
DL101
TRAP101
H DRIVER PWB ASS'Y
IC1
CN102
CN103
CN104
1
2
3
4
5

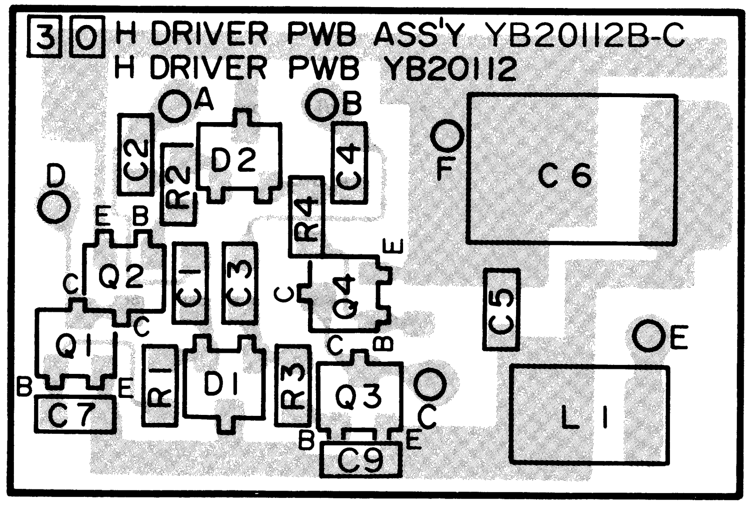

R IN
B IN
R GAIN
B GAIN
BLUE SEP
AGC
RED SEP
CDS OUT
B SET UP
CCD DRIVE FREQ
OSC FREQ
1
2
3
4
5


— Front —
A
B
C
1
2
3
4
5
VIDEO-1 PWB YB20072-02
H DRIVER PWB ASS'Y
LPF105
LPF104
LPF106
LPF103
CN107
CN104
CN103
CN102
CN106
CN101
IC1
L102
C107

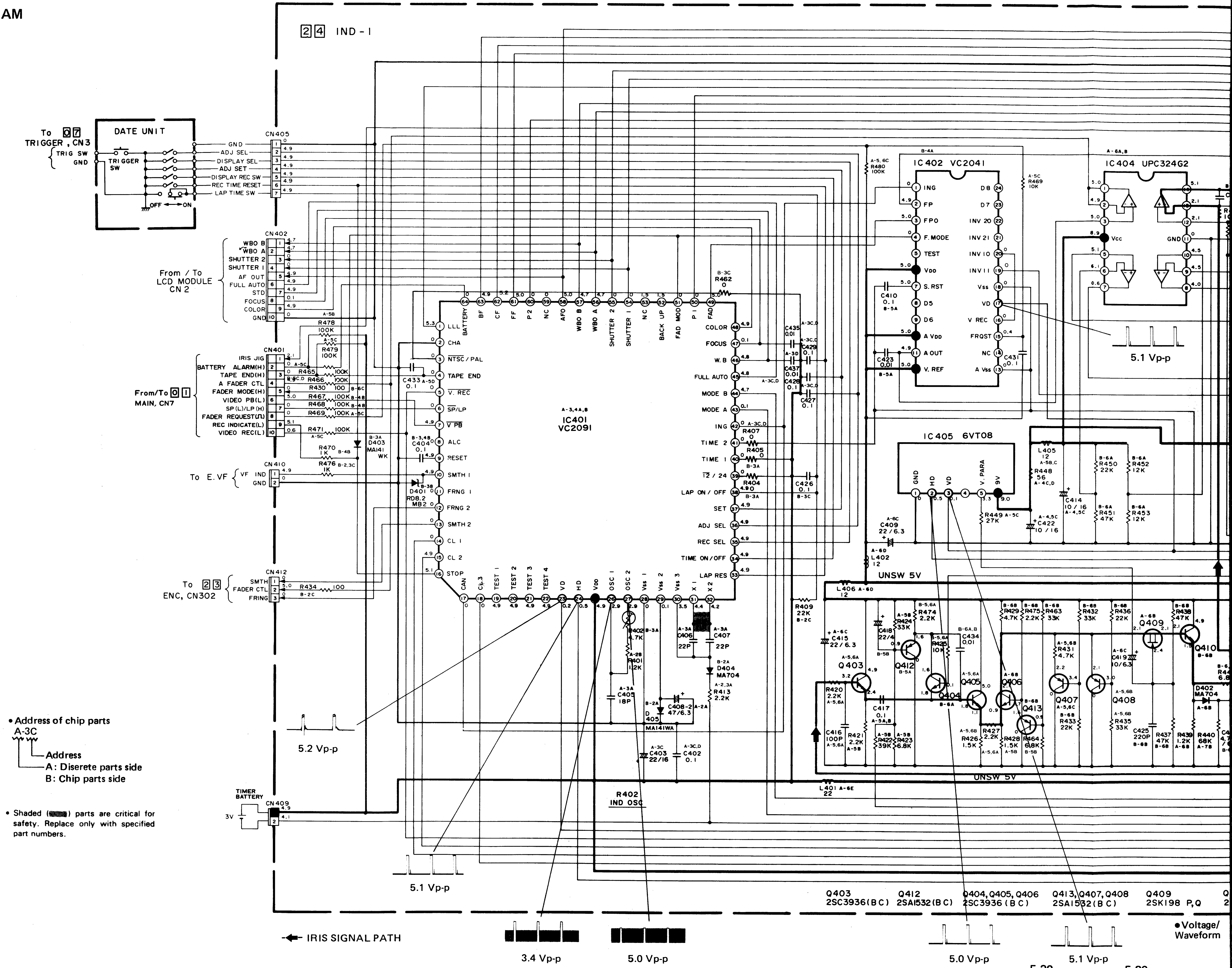
5.28 VIDEO-2 CIRCUIT BOARD


C
B
A
1
2
3
4
5
VIDEO-2 PWB ASS'Y YB20073B-03-C
VIDEO-2 PWB YB20073-01-03
22
LPF201
LPF202
L201
L202
C214
C207
CN201

5.29 H DRIVER CIRCUIT BOARD


30
H DRIVER PWB ASS'Y YB20112B-C
H DRIVER PWB YB20112
A
B
D
F
E
C
C2
R2
D2
C4
C6
R4
Q2
C1
C3
Q4
C5
Q1
R1
D1
R3
Q3
C7
C9
L1

5.30 INDICATOR-1 SCHEMATIC DIAGRAM



24 IND-1
To 07 TRIGGER, CN3
TRIG SW
GND
DATE UNIT
TRIGGER SW
OFF ON
CN405
GND
ADJ SEL
DISPLAY SEL
ADJ SET
DISPLAY REC SW
REC TIME RESET
LAP TIME SW
CN402
From / To LCD MODULE CN2
WBO B
WBO A
SHUTTER 2
SHUTTER 1
AF OUT
FULL AUTO
STD
FOCUS
COLOR
GND
CN401
From/To 01 MAIN, CN7
IRIS JIG
BATTERY ALARM(H)
TAPE END(H)
A FADER CTL
FADER MODE(H)
VIDEO PB(L)
SP(L)/LP(H)
FADER REQUEST
REC INDICATE(L)
VIDEO REC(L)
CN410
To E.VF
VF IND
GND
CN412
To 23 ENC, CN302
SMTH
FADER CTL
FRING
TIMER BATTERY
CN409
3V
IC401 VC2091
IC402 VC2041
IC404 UPC324G2
IC405 6VT08
UNSW 5V
R402 IND OSC
5.2 Vp-p
5.1 Vp-p
3.4 Vp-p
5.0 Vp-p
5.0 Vp-p
5.1 Vp-p
5.1 Vp-p
Q403 2SC3936(BC)
Q412 2SA1532(BC)
Q404,Q405,Q406 2SC3936(BC)
Q413,Q407,Q408 2SA1532(BC)
Q409 2SK198 P,Q
IRIS SIGNAL PATH
• Voltage/ Waveform

• Address of chip parts

A-3C

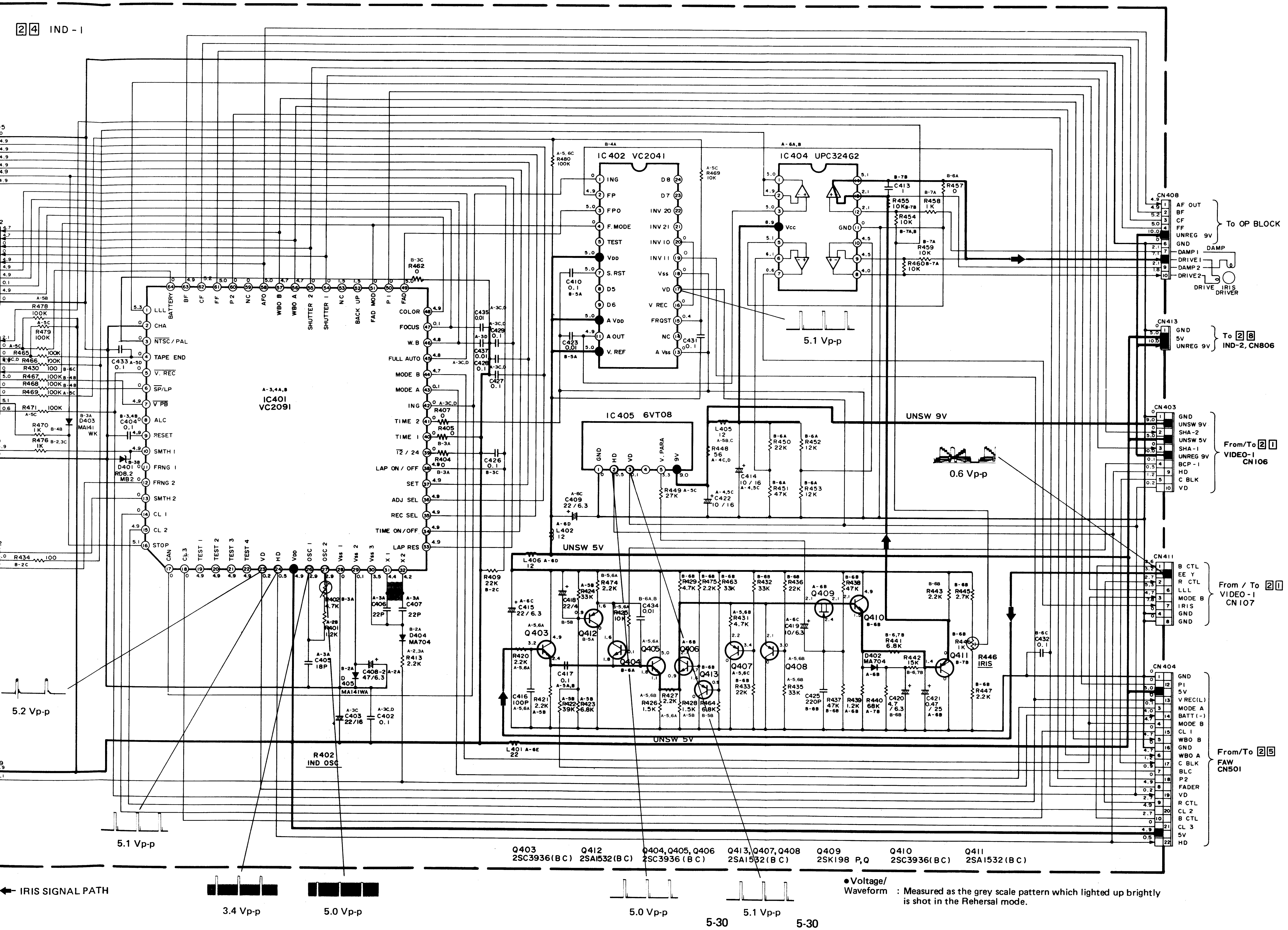
Address

A: Diserete parts side

B: Chip parts side

• Shaded (▆) parts are critical for safety. Replace only with specified part numbers.

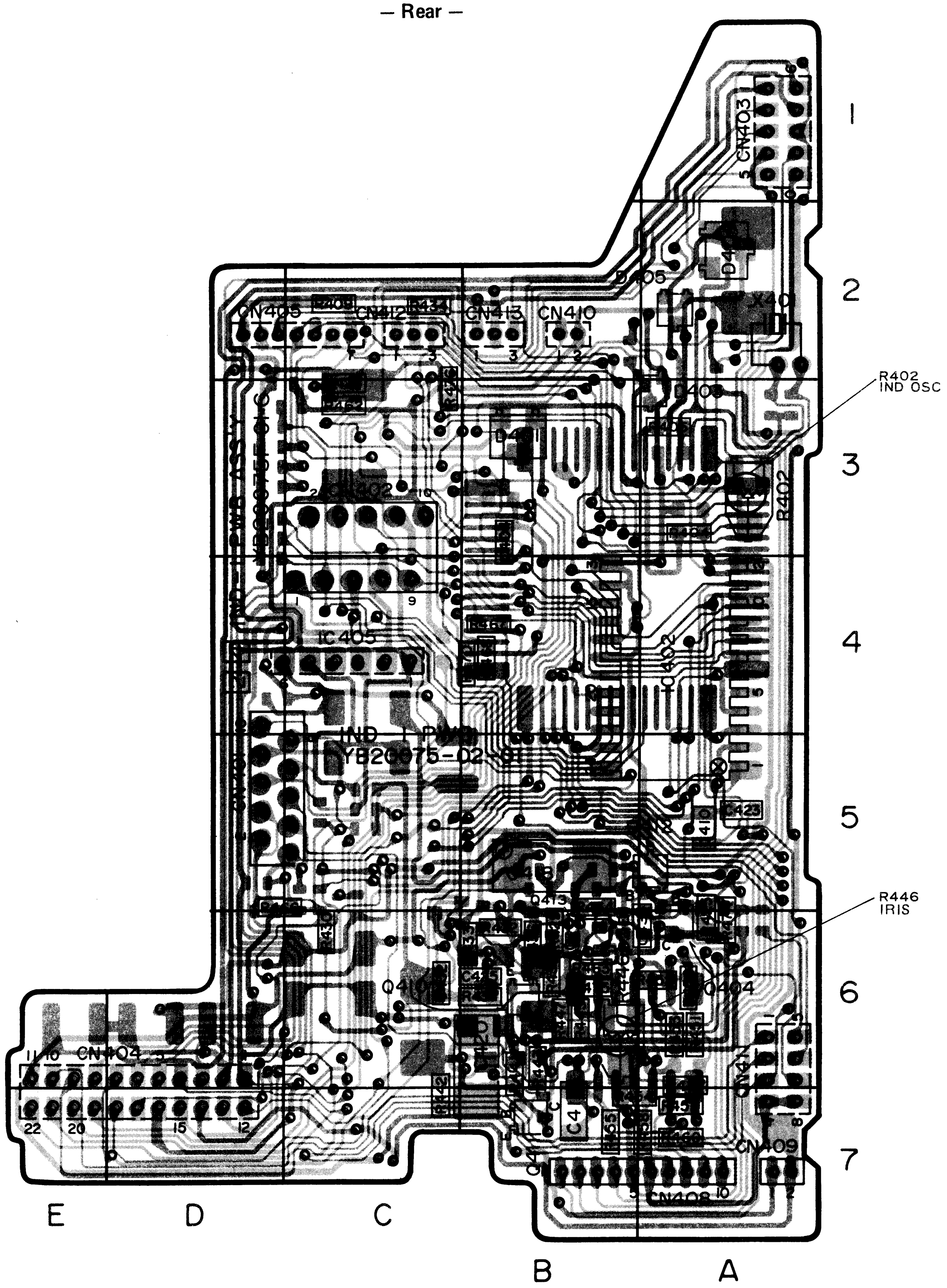
24 IND-1


IC401
VC2091
IC402 VC2041
IC404 UPC324G2
IC405 6VT08
ING
FP
FPO
F. MODE
TEST
VDD
S. RST
D5
D6
A VDD
A OUT
V. REF
D8
D7
INV 20
INV 21
INV 10
INV 11
Vss
VD
V REC
FRQST
NC
A Vss
Vcc
GND
LLL
CHA
NTSC / PAL
TAPE END
V. REC
SP/LP
V PB
ALC
RESET
SMTH I
FRNG I
FRNG 2
SMTH 2
CL I
CL 2
STOP
BATTERY
BF
CF
FF
NC
AFO
WBO B
WBO A
SHUTTER 2
SHUTTER I
N C
BACK UP
FAD MOD
P I
FAD
COLOR
FOCUS
W. B
FULL AUTO
MODE B
MODE A
ING
TIME 2
TIME I
12 / 24
LAP ON / OFF
SET
ADJ SEL
REC SEL
TIME ON / OFF
LAP RES
CAN
CL 3
TEST 1
TEST 2
TEST 3
TEST 4
VD
HD
VDD
OSC 1
OSC 2
Vss 1
Vss 2
Vss 3
X 1
X 2
GND
HD
VD
V. PARA
9V
UNSW 9V
UNSW 5V
L401 22
L402 12
L405 12
L406 12
R402 IND OSC
R446 IRIS
D401 RD8.2 MB2
D402 MA704
D403 MA141 WK
D404 MA704
D405 MA141WA
Q403
Q404
Q405
Q406
Q407
Q408
Q409
Q410
Q411
Q412
Q413
CN408
AF OUT
BF
CF
FF
UNREG 9V
GND
DAMP I
DRIVE I
DAMP 2
DRIVE 2
To OP BLOCK
DAMP
DRIVE
IRIS DRIVER
CN413
GND
5V
UNREG 9V
To 28 IND-2, CN806
CN403
GND
UNSW 9V
SHA-2
UNSW 5V
SHA-1
UNREG 9V
BCP-I
HD
C BLK
VD
From/To 21 VIDEO-1 CN106
CN411
B CTL
EE Y
R CTL
LLL
MODE B
IRIS
GND
GND
From / To 21 VIDEO-1 CN107
CN404
GND
PI
5V
V REC(L)
MODE A
BATT(-)
MODE B
CL I
WBO B
GND
WBO A
C BLK
BLC
P2
FADER
VD
R CTL
CL 2
B CTL
CL 3
5V
HD
From/To 25 FAW CN501
5.1 Vp-p
0.6 Vp-p
5.2 Vp-p
5.1 Vp-p
3.4 Vp-p
5.0 Vp-p
5.0 Vp-p
5.1 Vp-p
IRIS SIGNAL PATH
Q403 2SC3936(BC)
Q412 2SA1532(BC)
Q404, Q405, Q406 2SC3936(BC)
Q413, Q407, Q408 2SA1532(BC)
Q409 2SK198 P,Q
Q410 2SC3936(BC)
Q411 2SA1532(BC)

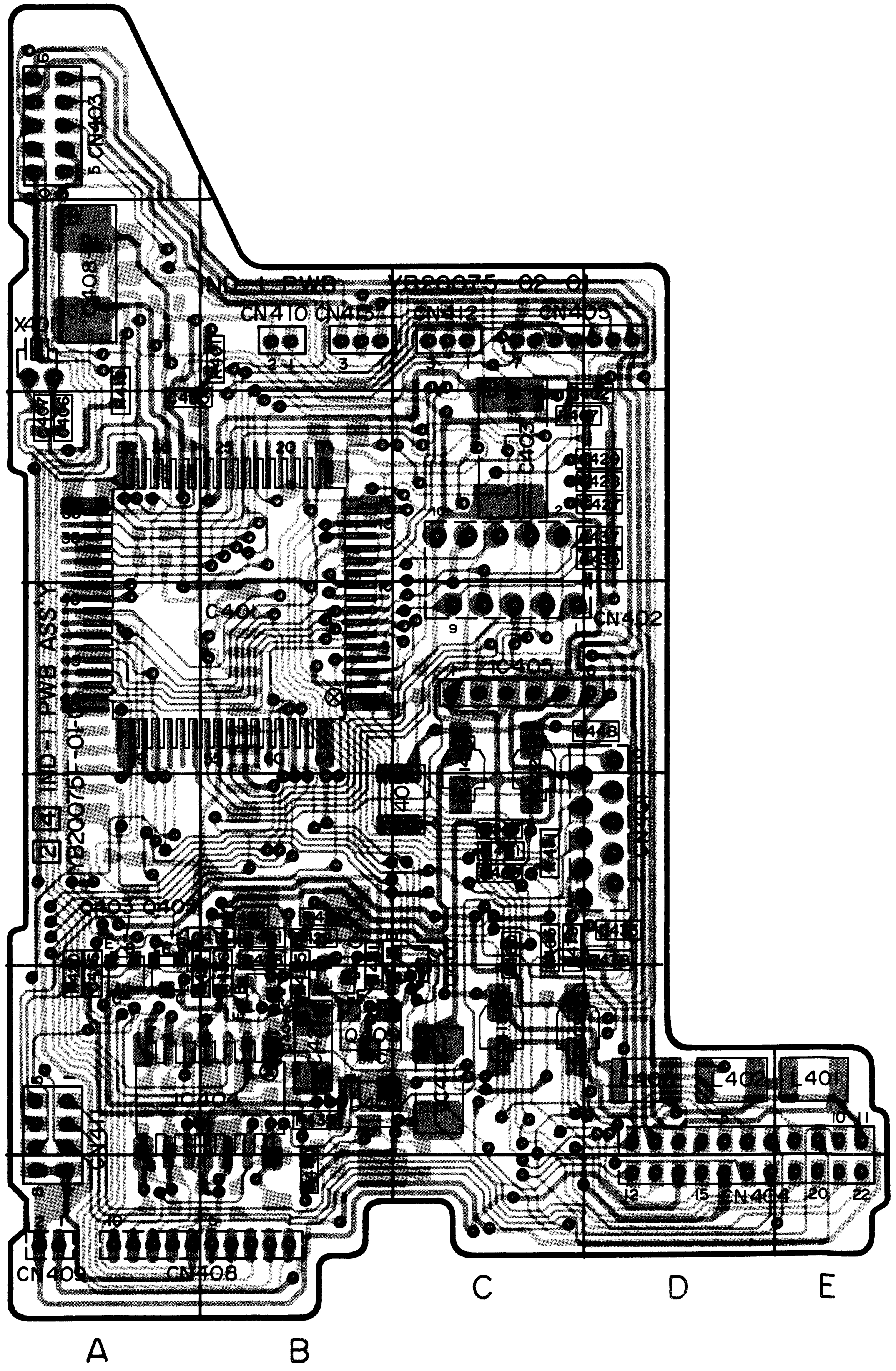
● Voltage/ Waveform : Measured as the grey scale pattern which lighted up brightly is shot in the Rehersal mode.

5.31 INDICATOR-1 CIRCUIT BOARD

– Rear –

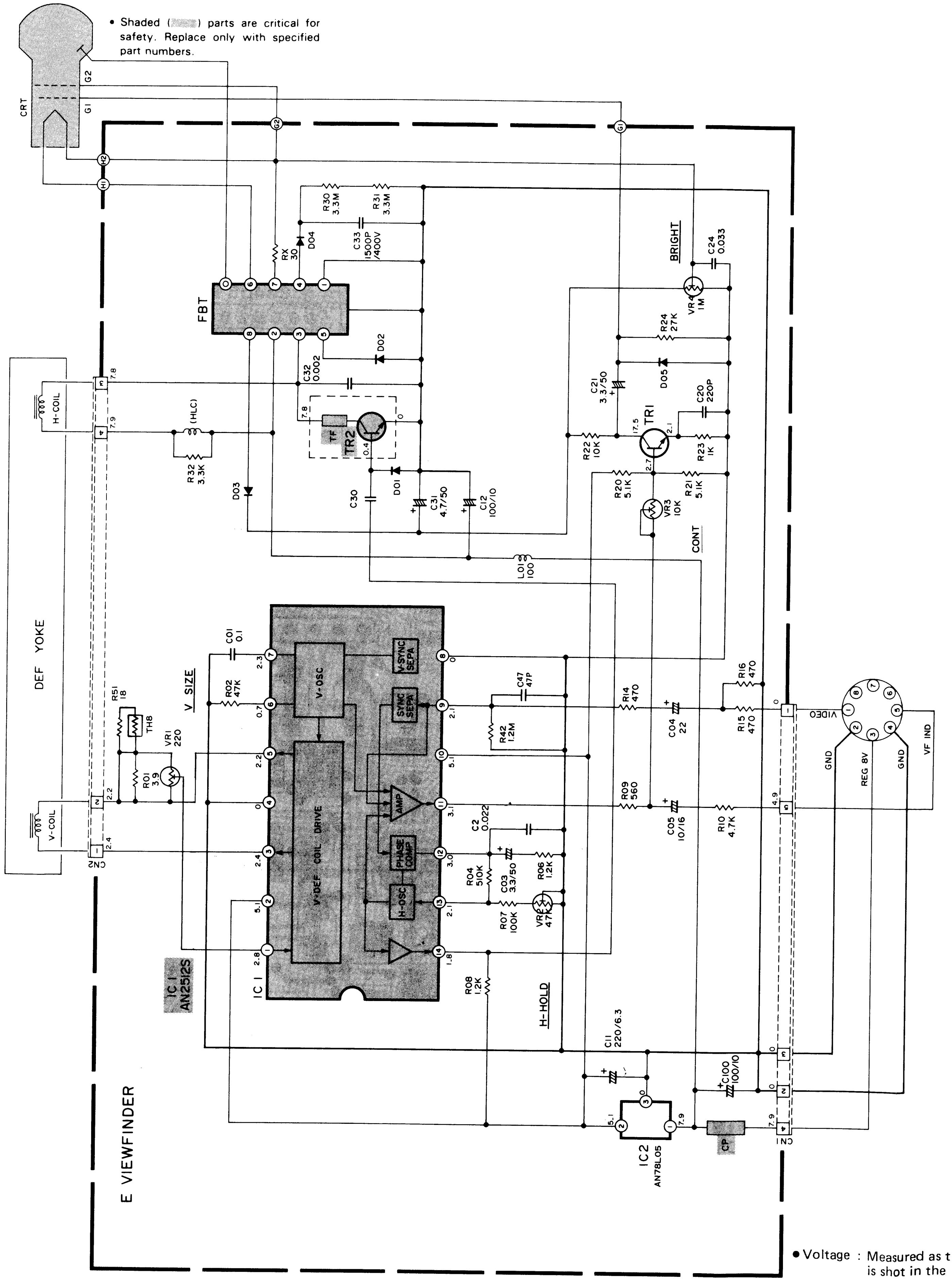

R402
IND OSC
R446
IRIS
CN403
CN406
CN412
CN413
CN410
CN402
IC405
IC402
Q413
Q410
Q404
CN404
CN411
CN409
CN408
IND PWB
YB20075-02-01
1
2
3
4
5
6
7
E
D
C
B
A

– Front –

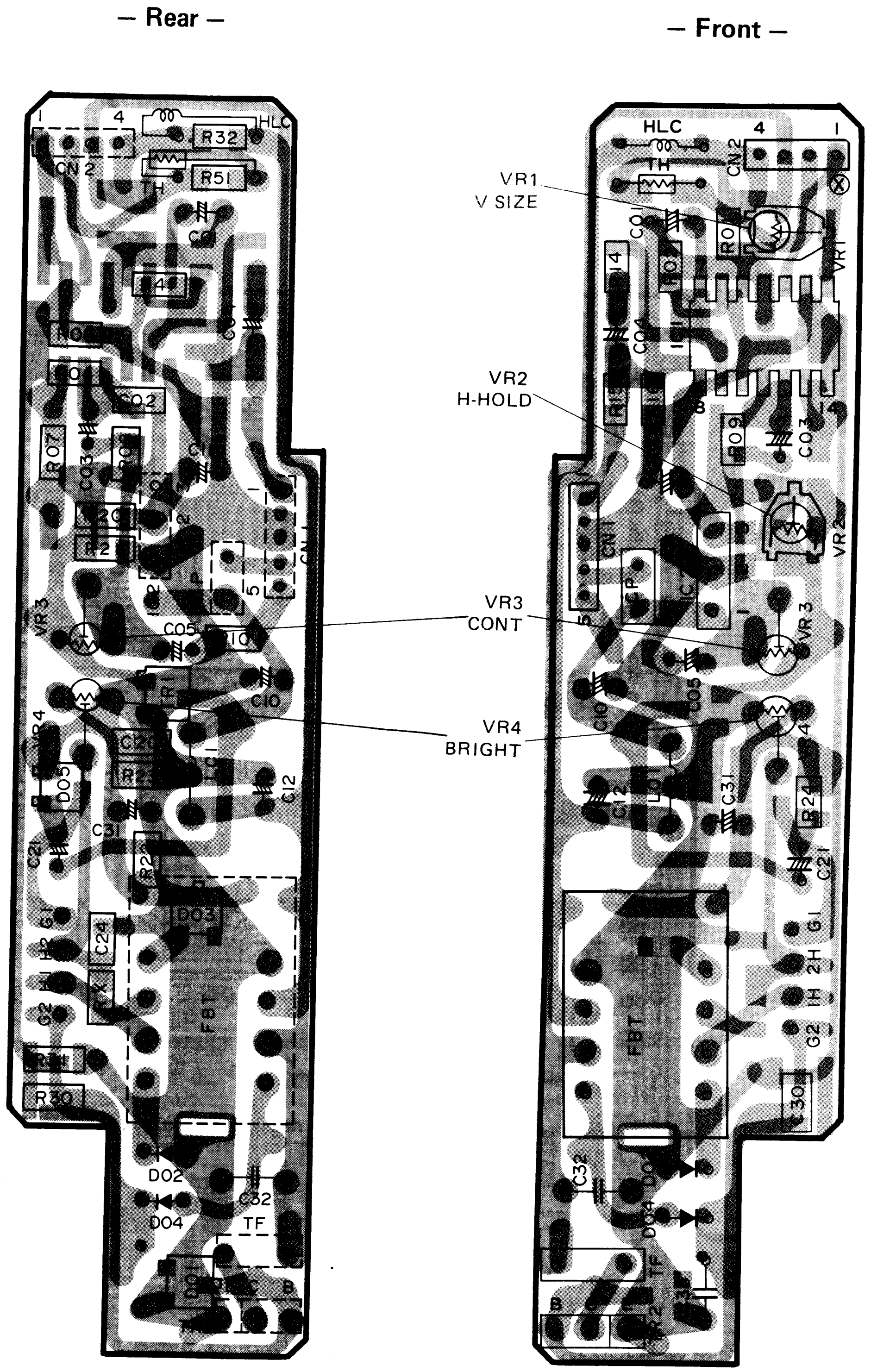

CN403
X401
IND-1 PWB YB20075-02-01
CN410
CN413
CN412
CN405
CN402
C401
IC405
IND-1 PWB ASS'Y
YB20075-01-0
L402
L401
CN404
CN409
CN408
1
2
3
4
5
6
7
A
B
C
D
E

5.32 ELECTRONIC VIEWFINDER SCHEMATIC DIAGRAM

- Shaded ( ) parts are critical for safety. Replace only with specified part numbers.


CRT
G2
G1
H2
H1
FBT
R30 3.3M
R31 3.3M
RX 30
D04
C33 1500P /400V
D02
C32 0.002
TF
TR2
D01
C30
C31 4.7/50
C12 100/10
D03
R32 3.3K
(HLC)
H-COIL
V-COIL
DEF YOKE
R51 18
TH8
R01 3.9
VR1 220
BRIGHT
C24 0.033
VR4 1M
R24 27K
D05
C21 3.3/50
C20 220P
TR1
R22 10K
R23 1K
R20 5.1K
R21 5.1K
VR3 10K
CONT
L01 100
C01 0.1
R02 47K
V SIZE
V-OSC
V-SYNC SEPA
SYNC SEPA
AMP
PHASE COMP
H-OSC
V-DEF COIL DRIVE
IC1 AN2512S
C47 47P
R42 1.2M
R14 470
R16 470
R15 470
C04 22
R09 560
C2 0.022
C05 10/16
R10 4.7K
R04 510K
C03 3.3/50
R06 1.2K
R07 100K
VR2 47K
R08 1.2K
H-HOLD
C11 220/6.3
C100 100/10
IC2 AN78L05
CP
CN2
CN1
VIDEO
GND
REG 8V
VF IND
E VIEWFINDER

5.33 ELECTRONIC VIEWFINDER CIRCUIT BOARD

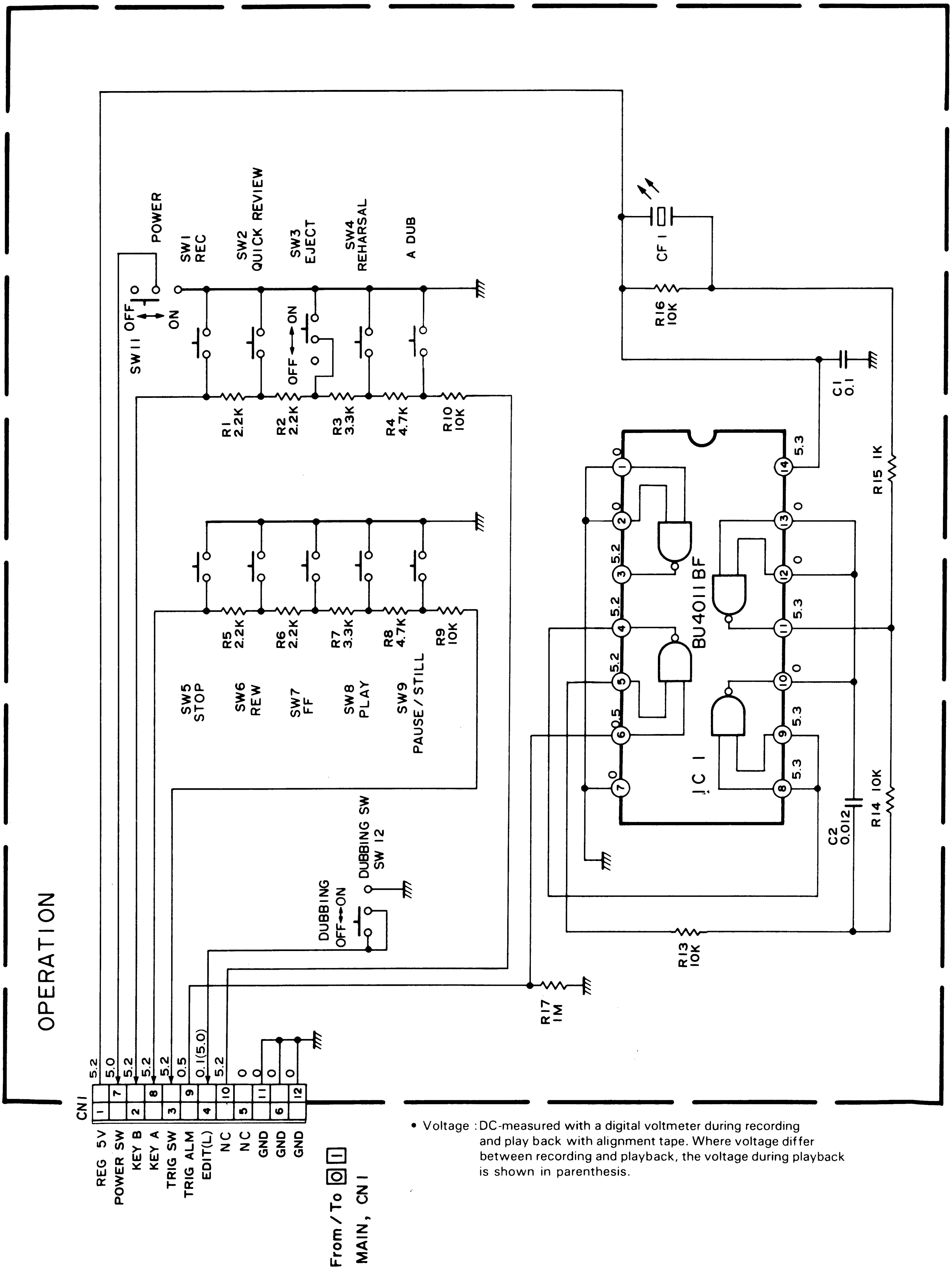

– Rear –
– Front –
VR1
V SIZE
VR2
H-HOLD
VR3
CONT
VR4
BRIGHT
CN2
HLC
R32
R51
FBT
D02
D04
C32
TF
R30
C24
G1
G2
H1
H2

- Voltage : Measured as the grey scale pattern which lighted up brightly is shot in the Rehersal mode.

5.35 OPERATION SCHEMATIC DIAGRAM

Note:

This schematic diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.



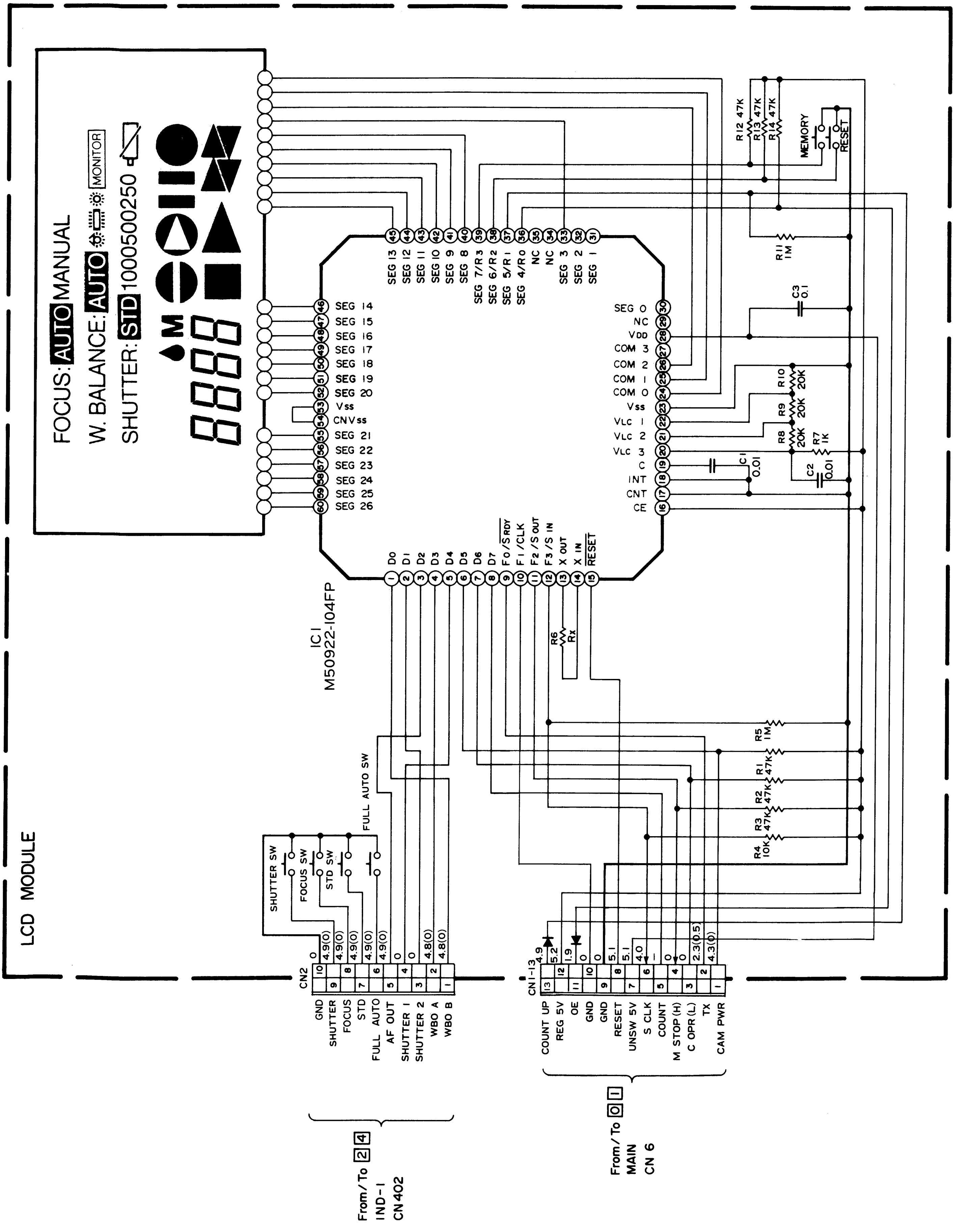
OPERATION
POWER
SW11 OFF ON
SW1 REC
SW2 QUICK REVIEW
SW3 EJECT OFF ON
SW4 REHARSAL
A DUB
R1 2.2K
R2 2.2K
R3 3.3K
R4 4.7K
R10 10K
R5 2.2K
R6 2.2K
R7 3.3K
R8 4.7K
R9 10K
SW5 STOP
SW6 REW
SW7 FF
SW8 PLAY
SW9 PAUSE / STILL
DUBBING SW SW 12
DUBBING OFF ON
CF1
R16 10K
C1 0.1
R15 1K
BU4011BF
IC1
C2 0.012
R14 10K
R13 10K
R17 1M
CN1
REG 5V
POWER SW
KEY B
KEY A
TRIG SW
TRIG ALM
EDIT(L)
NC
NC
GND
GND
GND
5.2
5.0
5.2
5.2
5.2
0.5
0.1(5.0)
5.2
0
0
0
0
From / To 01
MAIN, CN1

• Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

5.34 LCD MODULE SCHEMATIC DIAGRAM

- Voltage : DC-measured with a digital voltmeter during recording and play back with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

Note:
This schematic diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.



LCD MODULE
FOCUS: AUTO MANUAL
W. BALANCE: AUTO
MONITOR
SHUTTER: STD 1000500250
M
8888
IC1
M50922-104FP
SEG 13
SEG 12
SEG 11
SEG 10
SEG 9
SEG 8
SEG 7/R3
SEG 6/R2
SEG 5/R1
SEG 4/R0
NC
NC
SEG 3
SEG 2
SEG 1
SEG 14
SEG 15
SEG 16
SEG 17
SEG 18
SEG 19
SEG 20
Vss
CNVss
SEG 21
SEG 22
SEG 23
SEG 24
SEG 25
SEG 26
SEG 0
NC
VDD
COM 3
COM 2
COM 1
COM 0
Vss
VLC 1
VLC 2
VLC 3
C
INT
CNT
CE
D0
D1
D2
D3
D4
D5
D6
D7
F0/SRDY
F1/CLK
F2/SOUT
F3/SIN
X OUT
X IN
RESET
R12 47K
R13 47K
R14 47K
MEMORY
RESET
R11 1M
C3 0.1
R10 20K
R9 20K
R8 20K
R7 1K
C1 0.01
C2 0.01
R6 Rx
R5 1M
R1 47K
R2 47K
R3 47K
R4 10K
FULL AUTO SW
SHUTTER SW
FOCUS SW
STD SW
CN2
0
4.9(0)
4.9(0)
4.9(0)
4.9(0)
4.9(0)
0
0
4.8(0)
4.8(0)
GND
SHUTTER
FOCUS
STD
FULL AUTO
AF OUT
SHUTTER 1
SHUTTER 2
WBO A
WBO B
From/To 24
IND-1
CN402
CN1-13
4.9
5.2
1.9
0
0
5.1
5.1
4.0
1
0
0
2.3(0.5)
4.3(0)
COUNT UP
REG 5V
OE
GND
GND
RESET
UNSW 5V
S CLK
COUNT
M STOP (H)
C OPR (L)
TX
CAM PWR
From/To 01
MAIN
CN 6

SECTION 6
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

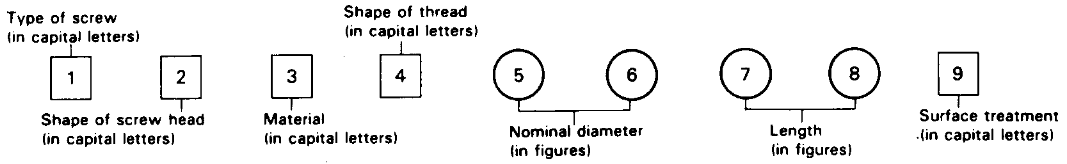
Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

NOTE: [M] indicates mechanical symbol number.

6.1 STANDARD PART NUMBER CODING

6.1.1 Screw coding

Standard screw part numbers are as follows.


Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

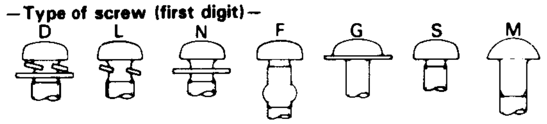
Type of screw (first digit)

S	Normal screws
D	Assembled machine screws (with plain and spring washers)
L	″ (with spring washer)
N	″ (with plain washer)
F	Feather screws
G	Washer head tapping screws
M	Wood screws

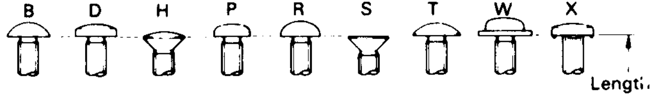
Shape of screw head (second digit)

B	Brazier head
D	Binding head
H	Oval countersunk head
P	Pan head
R	Round head
S	Flat head
T	Truss head
W	Washer head (machine screws)
X	Toothed head

—Type of screw (first digit)—



—Shape of screw head (second digit)—


B
D
H
P
R
S
T
W
X
Length

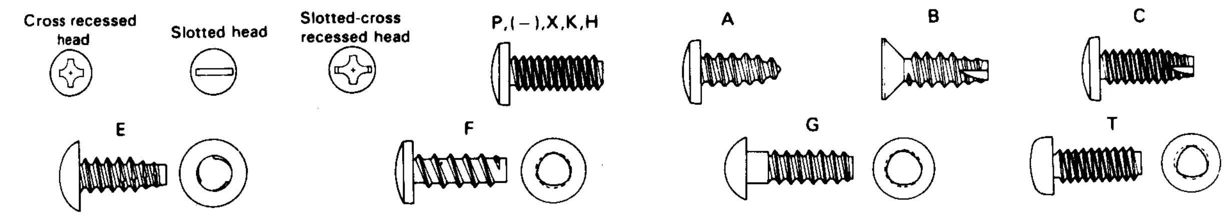
Material (third digit)

S	Steel	N	Nickel silver
E	Stainless steel	Y	Cast brass
C	Cast iron	A	Aluminum
U	Copper	Z	Zinc alloy
B	Brass	K	Polycarbonate
P	Phosphor bronze		

Shape of thread (fourth digit)

P	Cross recessed head screws
(–)	Slotted head machine screws
X	Slotted-cross recessed head machine screws
K	Cross recessed head machine screws for precision equipment (type 1)
H	″ (type 3)
A	Cross recessed head tapping screws (type 1)
B	″ (type 2)
C	″ (type 3)
E	Cross recessed head special tapping screws (brand : evertight)
F	″ (brand : P-tight)
T	″ (brand : taptight)
G	″

—Shape of thread (fourth digit)—


Cross recessed head
Slotted head
Slotted-cross recessed head
P,(–),X,K,H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

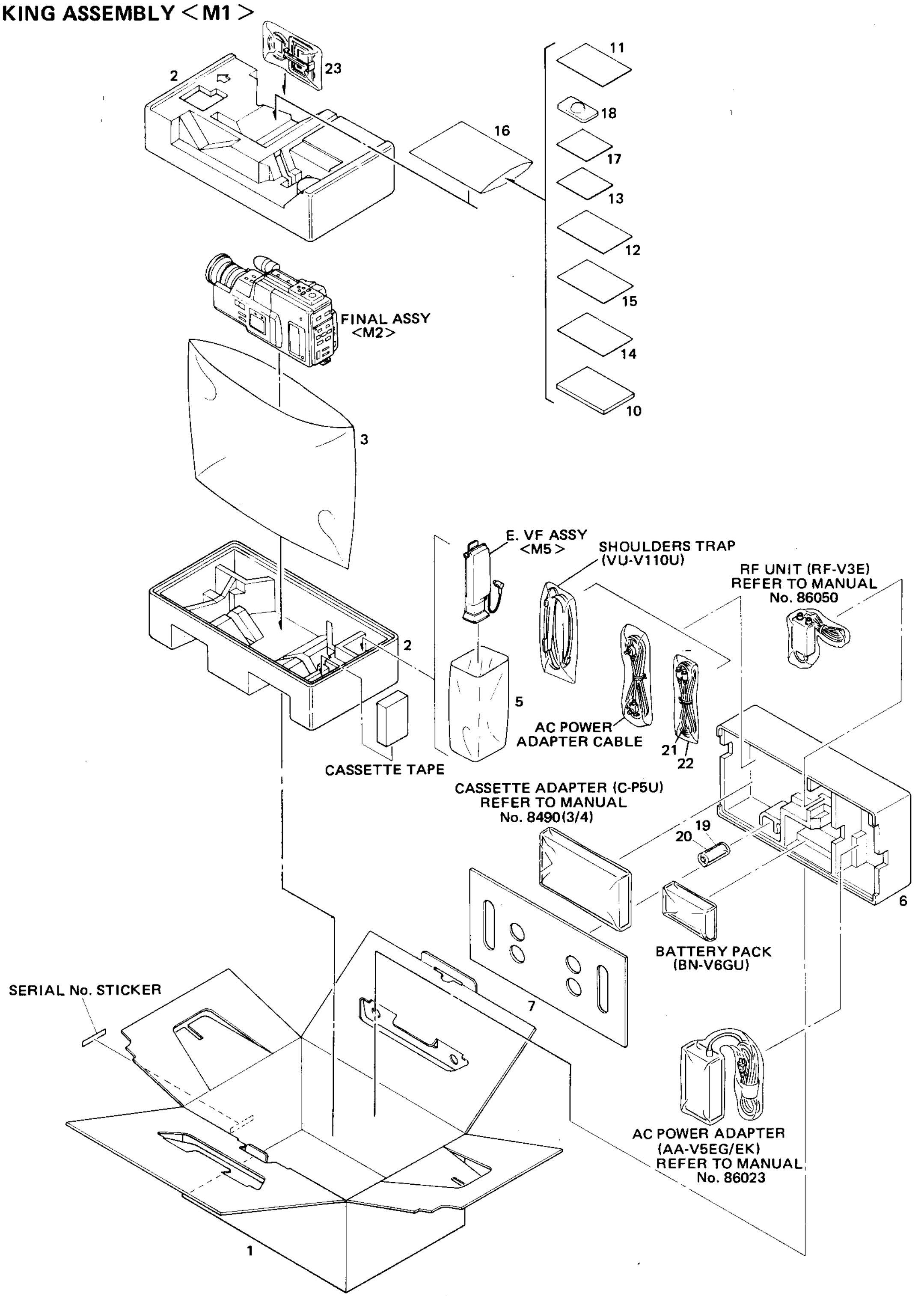
Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

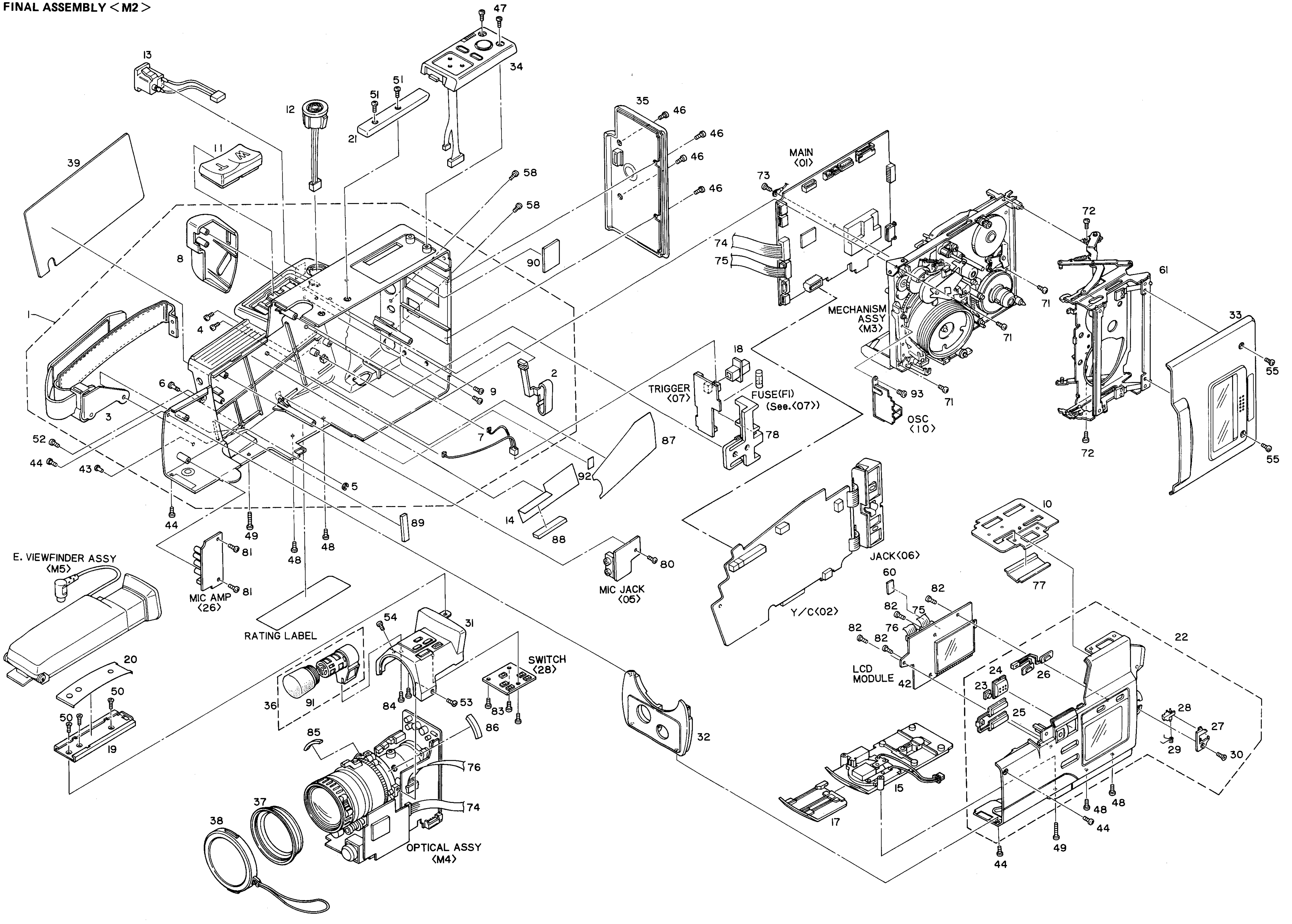
Z	Dichromate treatment after galvanizing (MFZn II-C)
N	Nickel plating (MFNiII, MFNiI)
R	Chromium plating (MBCrII, MBCrI)
G	Silver plating (SP4)
B	Black coating after plating
F	Blackening of iron (FB)
M	Blackening after galvanizing
K	Pickling of brass (PF2)
P	Phosphate treatment
W	Uni-chrome plating
L	Coated with transparent paint
A	Colored red after galvanizing (MFZnII-C)
C	Colored blue after galvanizing (MFZzII-C)
T	Colored green after galvanizing (MFZnII-C)
V	Colored purple after galvanizing (MFZnII-C)

6.2 PACKING ASSEMBLY <M1>


2
23
16
11
18
17
13
12
15
14
10
FINAL ASSY
<M2>
3
E. VF ASSY
<M5>
SHOULDERS TRAP
(VU-V110U)
RF UNIT (RF-V3E)
REFER TO MANUAL
No. 86050
2
5
AC POWER ADAPTER CABLE
21
22
CASSETTE TAPE
CASSETTE ADAPTER (C-P5U)
REFER TO MANUAL
No. 8490(3/4)
19
20
6
BATTERY PACK
(BN-V6GU)
SERIAL No. STICKER
7
AC POWER ADAPTER
(AA-V5EG/EK)
REFER TO MANUAL
No. 86023
1

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
			1. PACKING ASSEMBLY <M1>
	1	YQ30127-37	PACKING CASE,EK
		YQ30127-36	PACKING CASE,EG
	2	YU30274A	CUSHION ASSY
	3	YQM30021-11	POLY BAG
	5	YQM30021-7	POLY BAG
	6	YQ20123-1-1	ACCESSORY TRAY
	7	YQ40493-1-1	ACCESSORY TRAY SHEET
⚠	10	YU30052-74	INSTRUCTIONS,EG
⚠		YU30052-75	INSTRUCTIONS,EK
	11	BT-20060	GUARANTEE CARD,EK
	12	YU40406-13	MARKET.SHEET,EK
	13	BT-20066A	E.DISTRI.LIST,EK
	14	TCN-3379	TAPE CATALOGUE
	15	YU30217-2	TITLE CARD,EK
		YU30217-3	TITLE CARD,EG
	16	PQM30023-5	POLY BAG,EK
		QPGA025-03505	POLY BAG,EG
⚠	17	-	DBP INF SHEET,EG
⚠	18	YU40547	BATTERY
	19	QPGA005-01005	POLY BAG,EK
		PQM30021-48	POLY BAG,EG
	20	UM-3DJ	BATTERY
⚠	21	PU59167-3	CABLE ASSY
	22	QPGA015-02505	POLY BAG
	23	YU40856-1-1	TITLE HOLDER

6.3 FINAL ASSEMBLY <M2>



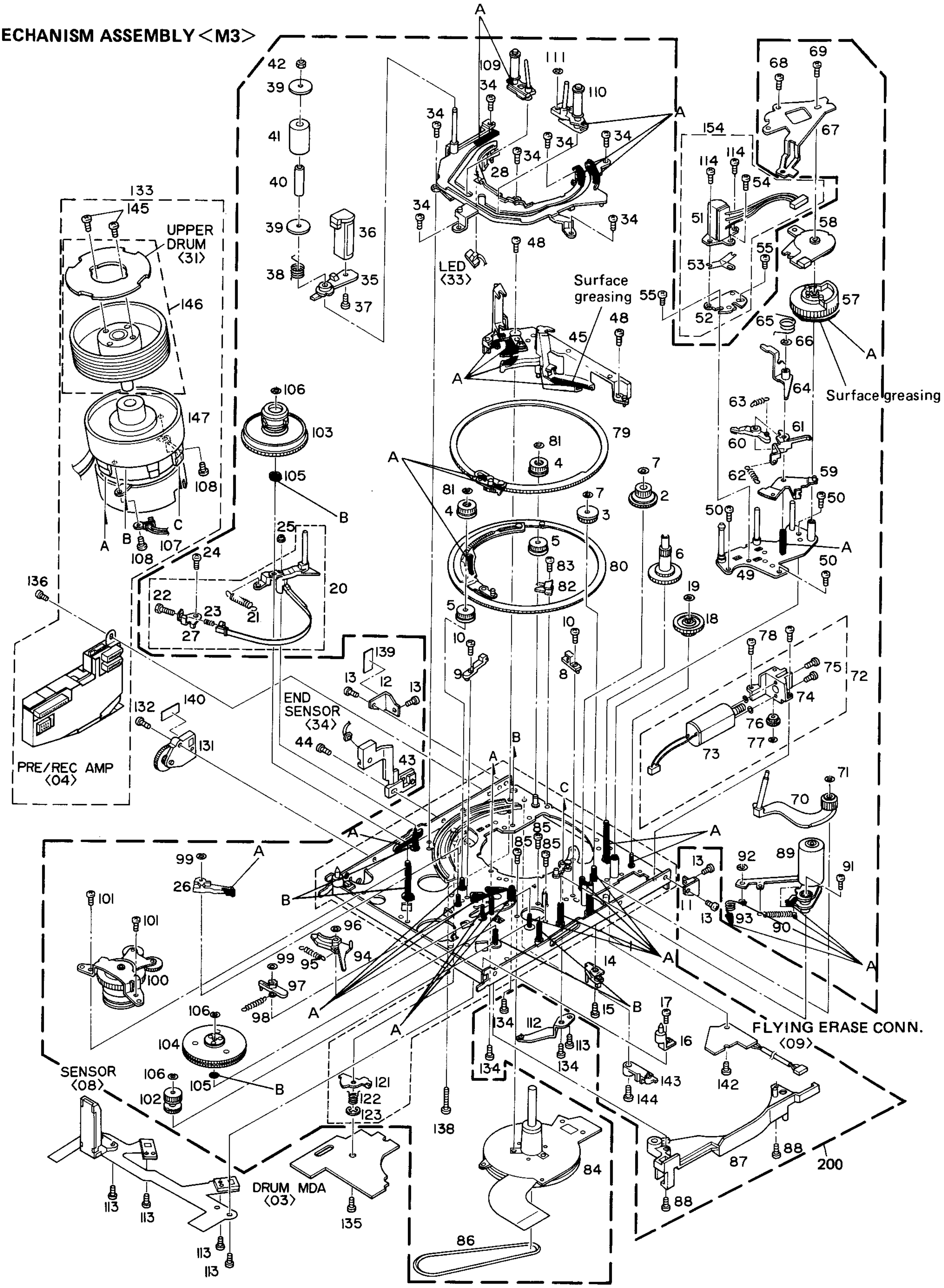
47
13
34
12
51
51
21
11
W
T
35
46
46
46
46
39
58
58
MAIN
<01>
73
72
8
90
74
75
61
1
4
MECHANISM
ASSY
<M3>
71
71
33
2
18
55
6
9
TRIGGER
<07>
FUSE(F1)
(See.<07>)
93
71
3
78
OSC
<10>
52
7
87
72
55
44
43
92
5
89
14
88
10
44
49
48
48
JACK<06>
E. VIEWFINDER ASSY
<M5>
81
80
77
60
82
81
MIC AMP
<26>
MIC JACK
<05>
82
75
Y/C<02>
76
82
82
RATING LABEL
54
31
22
20
SWITCH
<28>
LCD
MODULE
42
24
23
26
50
36
91
84
53
83
25
28
50
27
29
30
19
85
86
32
76
15
74
48
48
37
38
17
44
49
OPTICAL ASSY
<M4>
44

6-2

2. FINAL ASSEMBLY <M2>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
⚠	1	YQ10092Z-21	LOWER CASE ASSY,INCL.2-9
	2	YQ30091-1-4	BUTTON(TRIGGER)
	3	YQ20163B	GRIP BELT ASSY
	4	SSSP2006D	SCREW,X2
	5	REE2500	E.RING
	6	YQ40413	STUD
	7	ML-Y00062A	BATT TERMINAL WIRE ASSY
	8	YQ30098-26	FINGER REST
	9	SDSF2006Z	SCREW,X2
	10	YQ40417	SHOE BRACKET
	11	YU40204-4	ZOOM SWITCH
	12	YS40011C	E VF CONN.ASSY
	13	YS40004B	DC.JACK ASSY
	14	YQ40544	SHIELD SPACER 1
	15	YQ30099A-5	BASE ASSY
⚠	17	YQ30276-1-3	BACKUP BATT COVER
	18	YQ40418-2	ALARM KNOB
	19	YQ40419-1-2	SHOE
	20	YQ40420-1-2	SHOE SPRING
	21	YQ40421-1-1	DECO PLATE
⚠	22	YQ10086V-13	UPPER CASE ASSY,INCL.23-30
	23	YQ40705-2	FA KEY
	24	YQ40706	FOCUS KEY
	25	YQ40708	WHITE BALANCE KEY
	26	YQ40707	MEMORY KEY
	27	YQ30110	TAPE GUIDE HOLDER
	28	YQ30109-1-1	TAPE GUIDE(D)
	29	YQ40451	TORSION SPRING
	30	SSSG1740M	SCREW
⚠	31	YQ30246U	FRONT COVER ASSY
⚠	32	YQ30247A-1	FRONT PANEL ASSY
⚠	33	YQ30250V-10	CASSETTE COVER ASSY
	34	YQ30059-37	DATE UNIT
	35	YQ20197-4	OPERATION UNIT
	36	YU40631	MICROPHONE,INCL.91
	37	YU40190	HOOD
	38	YQ40437A-4	HOOD CAP ASSY
⚠	39	YU30207	BATTERY BASE SHEET
	42	YU41055-2	LCD MODULE
	43	YQ40703	CAP
	44	YQM30032-2-2	SPECIAL SCREW,X4 M2X5
	46	YQM30032-2-2	SPECIAL SCREW,X4 M2X5
	47	YQM30032-4-2	SPECIAL SCREW,X2
	48	YQM30032-1-2	SPECIAL SCREW,X4
	49	YQM30032-23	SPECIAL SCREW,X2
	50	SSSP2005D	SCREW.X3
	51	YQM30032-16-2	SPECIAL SCREW,X2
	52	YQM30032-1-2	SPECIAL SCREW
	53	YQM30032-28	SPECIAL SCREW
	54	YQM30032-1-2	SPECIAL SCREW,M2X4
	55	YQM30032-1-2	SPECIAL SCREW.X2 M2X4
	58	YQM30032-6-2	SPECIAL SCREW,X2
	60	YQ40520	DUMPER COVER
	61	YQ20068C	CASSETTE HOUSING ASSY
	71	SPSG2608Z	SCREW,X3
	72	SPSK1730M	SCREW,X2
	73	YQ40691	SPECIAL SCREW
	74	YU40614-3	FLAT WIRE 3
	OR	YU40894	FLAT WIRE3
	75	YU41014	FLAT WIRE 4
	OR	YU41013	FLAT WIRE 4
	76	YU40616	FLAT WIRE 5
	OR	YU40896	FLAT WIRE 5
	77	YQ40667	SCREW COVER
	78	YQ30311	TRIGGER BOARD STOPPER
	80	SDSF2006Z	SCREW
	81	SDSF2006Z	SCREW,X2
	82	SDSF2005Z	SCREW,X4
	83	YQM30032-29	SCREW,X3
	84	YQM30032-29	SCREW,X2
	85	YQM30029-4	SPACER
	86	YQM30029-5	SPACER
	87	YQ40545	SHIELD SPACER 2
	88	YQM30029-8	SPACER
	89	YQM30029-7	SPACER
	90	YQM30029-9	SPACER
	91	YU40631-001	WIND SCREEN
	92	YQ40903-1-1	SPACER
	93	SPSH1725M	SCREW

6.4 MECHANISM ASSEMBLY <M3>


A
42
39
41
40
39
36
38
35
37
109
111
110
34
28
34
34
34
34
34
LED
<33>
48
Surface greasing
55
48
45
A
154
114
114
54
51
53
55
52
68
69
67
58
57
65
66
A
Surface greasing
64
63
61
60
62
59
50
50
49
A
50
133
145
UPPER DRUM <31>
146
147
108
A
B
C
108
107
106
103
105
B
25
24
20
22
23
21
27
79
81
4
A
81
4
7
2
7
3
5
83
82
80
6
19
18
5
10
9
10
8
136
139
13
12
13
END SENSOR <34>
44
43
132
140
131
PRE/REC AMP <04>
B
A
C
78
75
72
74
76
77
73
71
70
99
A
26
101
101
100
96
99
95
94
97
98
A
106
104
106
105
B
102
SENSOR <08>
A
B
85
85
85
A
13
92
89
91
11
13
93
90
A
A
14
B
15
17
16
134
112
113
134
134
121
122
123
143
144
142
FLYING ERASE CONN. <09>
138
84
87
88
200
88
DRUM MDA <03>
135
113
113
113
113
86

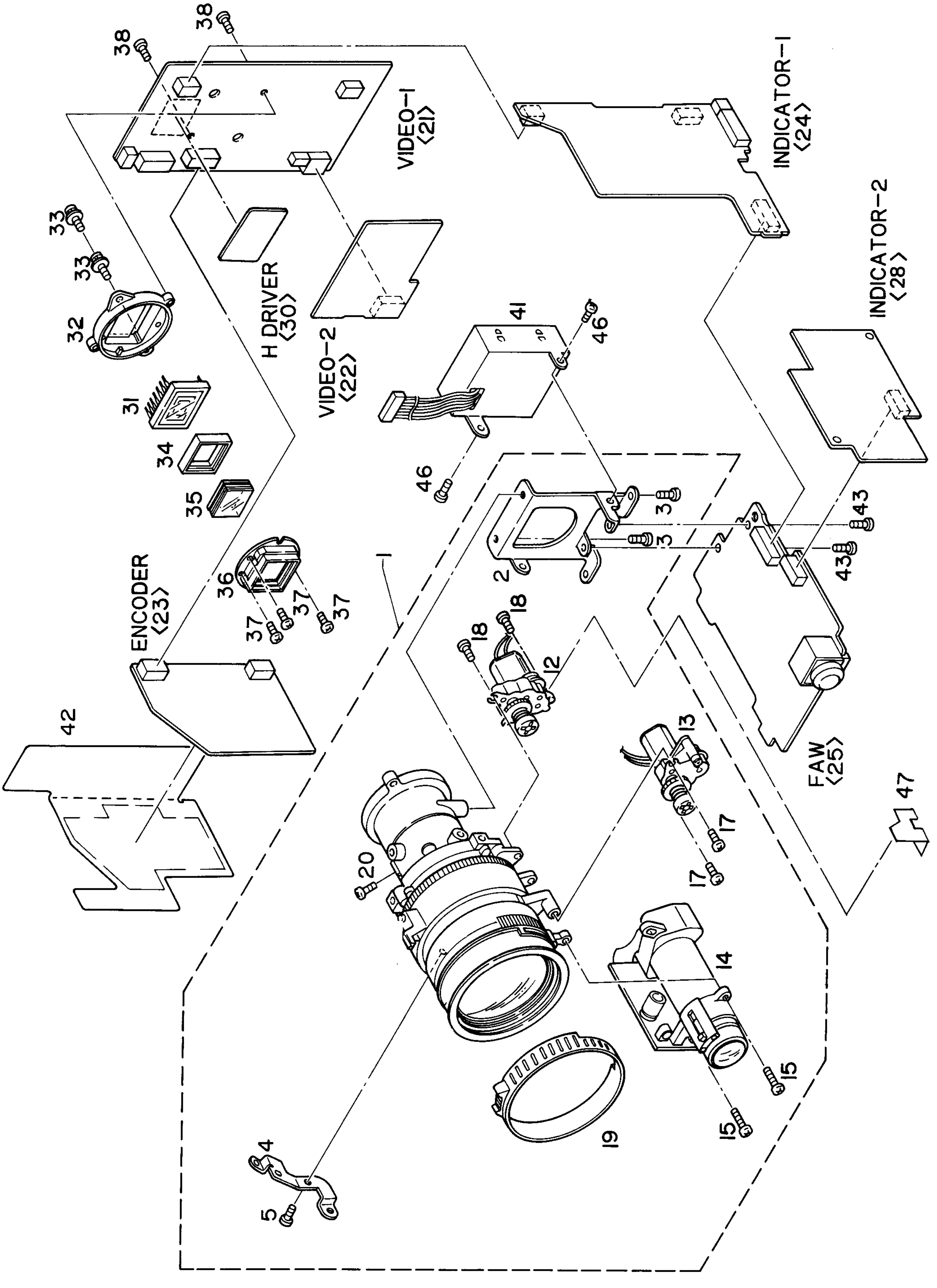
Classifi-cation	Name	Parts No.	Symbol in drawing
Grease	Moriton Grease No. 1	MOS2-C	A
Oil	Cosmo Hydro HV100	YTU94027	B

Note:
The sections marked in red indicate lubrication and greasing areas. Follow the items for maintenance and checks, lubricating or greasing the red sections when necessary.

3. MECHANISM ASSEMBLY <M3>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	1	YQ10089A-9	MAIN DECK ASS'Y, INCL. 121–123
	2	YQ40744	LOADING GEAR 1
	3	YQ40123	LOADING GEAR 2
	4	YQ40124	RING G.GEAR(S),X2
	5	YQ40125-2	RING G.GEAR(T),X2
	6	YQ30271	TERMINAL GEAR
	7	PQM30017-27	SLIT WASHER,X2
	8	YQ40746-1-1	RING GUIDE 1
	9	YQ40128-1-1	RING GUIDE 3
	10	SPSH1725M	SCREW,X2
	11	YQ40747	SUPPORT(L)
	12	YQ40748	SUPPORT(R)
	13	SPSH1725M	SCREW,X4
	14	YQ30460	LOADING GUIDE
	15	SPSH1740M	MINI SCREW
	16	YQ40801-1-4	GUIDE PIN
	17	SPSH1725M	SCREW
	18	YQ40750	MIDDLE GEAR
	19	PQM30017-27	SLIT WASHER
	20	YQ40389B-4	TENSION SERVO AY,INCL.21-23,27
	21	YQM30001-30	T.SPRING
	22	SPSK1780M	MINI SCREW
	23	YQM30002-1	COMPRESSION SPRING
	24	SPSH1725M	SCREW
	25	YQ40059	CAP
	26	YQ30322-1-1	SUP BRAKE LINK
	27	YQ40266	ADJUST PLATE
	28	YQ40759A-4	GUIDE RAIL ASSY
	34	SPSH1725M	SCREW,X7
	35	YQ20050-1-7	FE HEAD ARM
	36	YU40492-2	F.E.HEAD
	37	SPSK1630M	SCREW
	38	YQ40391-1-2	TORSION SPRING
	39	YQ40063	FLANGE,X2
	40	YQ40064-1-1	COLLAR
	41	YQ40065-2	IMPEDANCE ROLLER
	42	NTS2000N	NUT
	43	YQ30265	E.SENS.BRACKET
	44	SPSH1740M	MINI SCREW
	45	YQ40762A-4	UV BASE ASSY
	48	SPSH1730M	MINI SCREW,X2
	49	YQ40763A-5	SUB DECK ASS'Y
	50	SPSH1725M	SCREW,X3
	51	YU40618	AUDIO/CONTROL HEAD
	52	YQ40768	X PLATE
	53	YQ40354-1-2	HEAD SPRING
	54	YQ40904B	ALOCK SCREW,M1.7X3
	55	YQ40904C	ALOCK SCREW,X2
	57	YQ20057-1-3	CAM GEAR
	58	YU41080	CAM ENCODER
	59	YQ40769A-5	ARM GEAR ASS'Y
	60	YQ40358	LOCK ARM 1
	61	YQ40771	LOCK ARM 2
	62	YQ40342	TENSION SPRING
	63	YQ40362	TENSION SPRING
	64	YQ40772A-1	LOCK ARM 3 ASSY
	65	YQ41113	TORSION SPRING
	66	PQM30017-25	SLIT WASHER
	67	YQ30266-1-4	MIDDLE POLE STOPPER
	68	SPSH1725M	SCREW
	69	SPSH1780M	SCREW
	70	YQ40774A-1	MIDDLE POLE ASSY
	71	PQM30017-23	SLIT WASHER
⚠	72	YQ30272A-5	LOADING MOTOR BKT ASSY, INCL. 73–77
⚠	73	YU40620V-1	LOADING MOTOR
	74	YQ40777A-4	L.M.BRACKET SA
	75	SPSH1425M	SCREW,X2
	76	YQ40778	WORM WHEEL
	77	PQM30017-27	SLIT WASHER
	78	SPSH1730M	MINI SCREW,X2
	79	YQ40779A	SUP LOADING RING ASSY
	80	YQ40781A-3	TU LOADING RING ASSY
	81	PQM30017-27	SLIT WASHER,X2
	82	YQ40784	RING GUIDE 2
	83	SPSH1725M	SCREW
⚠	84	YU40621V	CAP MOTOR ASSY
⚠		OR YU40930V	CAP MOTOR ASSY
	85	SPSH1725M	SCREW,X3
	86	YQM30003-3	BELT
	87	YQ30268-1-3	CAP MOTOR COVER
	88	SPSH1740M	MINI SCREW,X2
	89	YQ40785A-1	PINCH ROLLER ARM ASSY, INCL. 90
		OR YQ40785C	PINCH ROLLER ARM ASSY, INCL. 90
		OR YQ40785B-1	PINCH ROLLER ARM ASSY, INCL. 90
	90	YQ40793	TORSION SPRING
	91	PQ41535-4	SCREW
	92	PQM30017-27	SLIT WASHER
	93	YQ40794-1-1	TORSION SPRING
	94	YQ30269	TU BRAKE LEVER
	95	YQ40796-1-2	T.SPRING
	96	PQM30017-27	SLIT WASHER
	97	YQ30270	SUP BRAKE LEVER
	98	YQ40798-1-1	TORSION SPRING
	99	PQM30017-27	SLIT WASHER,X2
	100	YU40622-1-2	CENTER PULLEY BRACKET ASSY
	101	SPSH1725M	SCREW,X2
	102	YQ40147-1-1	TU GEAR
	103	YU40623-1-1	SUP REEL DISC ASSY
	104	YU40624-1-1	TU.CLUTCH ASS'Y
	105	Q03093-835	WASHER,X2
	106	PQM30017-27	SLIT WASHER,X3
	107	YU41074	DEW SENSOR
	108	SPSK1725M	SCREW,X2
	109	YQ40083C-12	SUP POLE BASE ASSY
	110	YQ40799B-5	TU POLE BASE ASSY
	111	PQM30017-27	SLIT WASHER
	112	YU40716	BRUSH
	113	SPSH1730M	MINI SCREW,X5
	114	YQ40904A-1	ALOCK SCREW,X2
	121	YQ40737-1-2	EJECT LEVER
	122	YQ40739-1-3	TORSION SPRING
	123	REE4000	E REING
	131	YU40001	DAMPER
	132	SPSH1760M	SCREW
⚠	133	YDV2014A	DRUM ASSY,INCL<04><31>107,108, 145–147
	134	SPSH1730M	MINI SCREW,X3
	135	PQ41450-2	SCREW
	136	SPSH1720M	MINI SCREW
	138	SPSH1711M	SCREW
	139	YQ40520	DUMPER COVER
	140	YQ40520	DUMPER COVER
	142	PQ41450-2	SCREW,FLY BOARD
	143	YQ41172	FLY WIRE GUIDE
	144	SPSH1725M	SCREW
	145	YDM4031	SCREW, X2
	146	YDM2018B	UPPER DRUM ASSY
	147	YDM2020B	LOWER DRUM MOTOR ASSY
	154	YS40016C	A/C HEAD ASSY,INCL.51-54,114
	200	YS20144D	MECHANISM SUB ASSY

6.5 OPTICAL BLOCK ASSEMBLY <M4>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ENCODER
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37
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18
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42
13
FAW
<25>
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17
14
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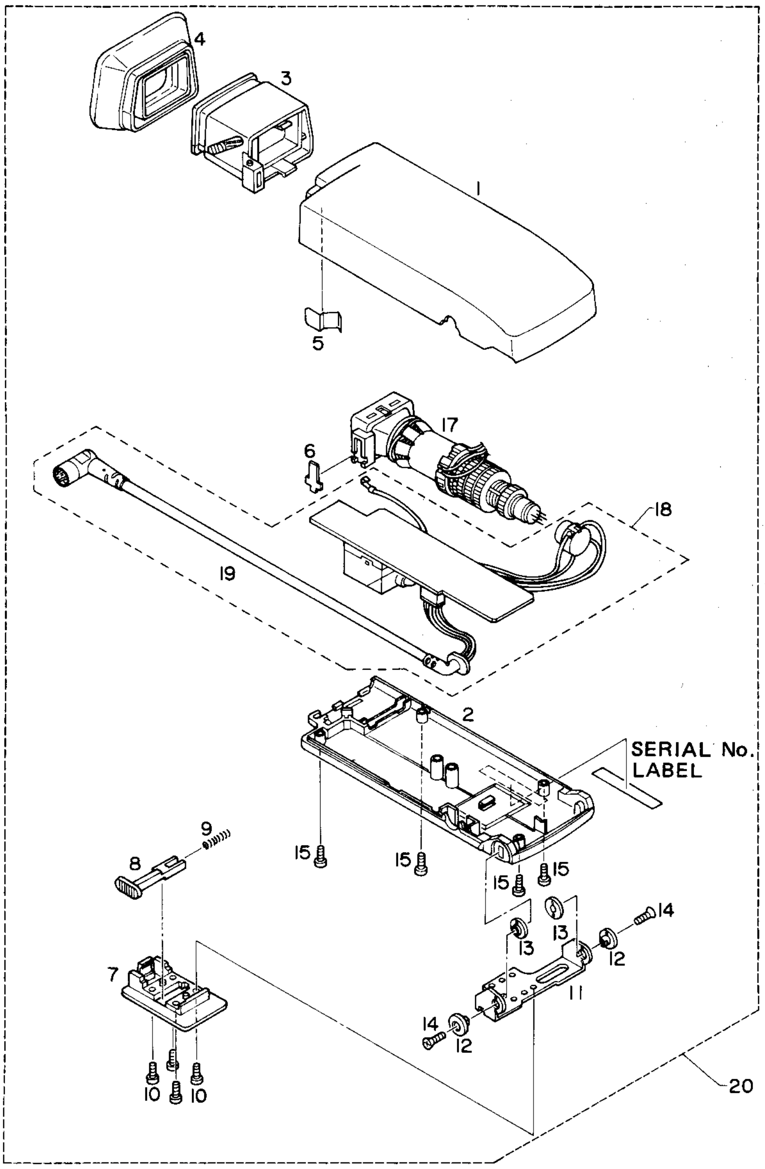
4
5

♦⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION

4. OPTICAL BLOCK ASSEMBLY <M4>

♦⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
⚠	1	YU40635-2-2	OP BLOCK AY,INCL.2-5,12-20
	2	YQ40826-1-2	OP BRACKET
	3	SDSF2605Z	SCREW,X2
	4	YQ40711	LENS BRACKET
	5	SDSF2605Z	SCREW
	12	YU40189-002	ZOOM MOTOR UNIT
	13	YU40189-003	AUTO FOCUS MOTOR UNIT
	14	YU40635-004	AUTO FOCUS UNIT
	15	YU40189-005	SCREW,X2 M1.7X6
	17	YU40189-006	SCREW,X2 M1.7X4
	18	YU40189-006	SCREW,X2 M1.7X4
	19	YU40189-009	RUBBER
	20	YU40189-010	SCREW,M2.X5.5
⚠	31	UPD3556D	IC(CCD)
	32	YQ30095	IMAGER HOLDER
	33	DPSP2008Z	SCREW,X2
	34	PQ42339	SPACER RUBBER
	35	YU40694	OPTICAL LPF
	36	YQ30096-2	OPTICAL LPF HOLDER
	37	SPSK2004F	MINI SCREW,X3
	38	SPSP2004Z	SCREW,X2
⚠	41	YU40838	DC-DC CONVERTER
⚠		OR YU41058	DC-DC CONVERTER
	42	YU30212	SHIELD PLATE
	43	SPSP2004Z	SCREW,X2
	46	SPSP2004Z	SCREW,X2
	47	YQ41110-1-1	PULLEY COVER

6.6 ELECTRONIC VIEWFINDER ASSEMBLY<M5>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SERIAL No.
LABEL
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* 5. ELECTRICAL VIEWFINDER ASSEMBLY <M5> *

****

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	1	YU30181-102	TOP CASE
	2	YU30181-002	BOTTOM CASE
	3	YU30181-003	LENS ASSY
	4	YU30181-004	LENS RUBBER
	5	YU32181-005	PLATE SPRING
	6	YU30181-014	HIGH VOLTAGE COVER
	7	YU30181-006	SHOE
	8	YU30181-007	LEVER
	9	YU30045-016	SPRING
	10	YU30045-013	SCREW,X4
	11	YU30181-008	ARM
	12	YU30181-009	COVER,X2
	13	YU30045-022	BUSHING,X2
	14	YU30181-010	SCREW,X2
	15	YU30045-014	SCREW,X4
	17	YU30181-011	CRT ASSY
	18	YU30181-015	E.VF BOARD ASSY,INCL.19
	19	YU30181-013	VF CABLE
⚠	20	YU30181T	E.VIEWFINDER ASSY,INCL.1-19

SECTION 7
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS USED IN THIS PARTS LIST

RESISTORS	: All resistance values are in ohms (Ω), unless otherwise indicated.
k	: 1,000 (Kilo)
M	: 1,000,000 (Mega)

RESISTOR	: Resistor Carbon resistor Chip resistor Double chip resistor
FUSIBLE RESISTOR	: Fusible resistor
MF RESISTOR	: Metal film resistor
MP RESISTOR	: Metal plate resistor
OMF RESISTOR	: Oxide metal film resistor
V RESISTOR	: Variable resistor Chip variable resistor

CAPACITORS	: All capacitance values are in µF, unless otherwise indicated.
pF	: Picofarad (10^{-6} µF)

CAPACITOR	: Capacitor Ceramic capacitor Chip capacitor
E CAPACITOR	: Electrolytic capacitor Chip electrolytic capacitor
FM CAPACITOR	: Film Mica capacitor
M CAPACITOR	: Mylar capacitor
MM CAPACITOR	: Metalized mylar capacitor Metalized paper capacitor
NP E CAPACITOR	: Non-polar electrolytic capacitor Non-polar capacitor
PP CAPACITOR	: Polypropylene capacitor
TANTAL CAPACITOR	: Tantalum capacitor Chip tantalum capacitor
TF CAPACITOR	: Thin film capacitor
TRIMMER CAPACITOR	: Trimmer capacitor Chip trimmer capacitor

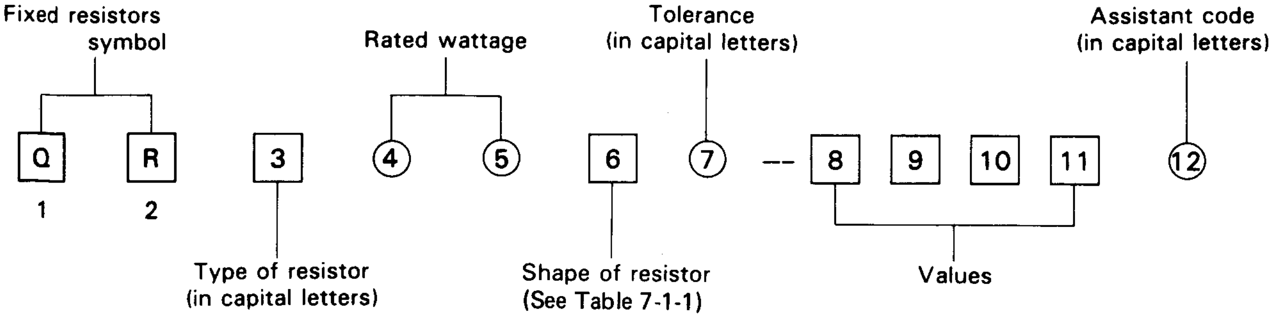
Notes:

- < 2 digits > indicates circuit board symbol number.
- "X " indicates quantity per set.

7.1 STANDARD PART NUMBER CODING

7.1.1 Fixed resistor coding

Fixed resistor part numbers are as follows.


Fixed resistors symbol
Rated wattage
Tolerance (in capital letters)
Assistant code (in capital letters)
Q
R
3
④
⑤
6
⑦
--
8
9
10
11
⑫
1
2
Type of resistor (in capital letters)
Shape of resistor (See Table 7-1-1)
Values

Type of resistor (third digit)

C	Composition resistors
D	Carbon resistors
F	Unflammable resistors
G	Oxide metal film resistors
H	Fusible resistors
M	Metal plate resistors
S	Metal glazed resistors
V	Precision metal film resistors
W	Wire wound resistors
X	Metal film resistors
Z	Special resistors
B	Network resistors

Notes: first–third digits

NR☐ :	Chip resistors
QVP :	Variable resistors
NVP :	Chip variable resistors
NRB :	Chip network resistors

Rated wattage (fourth and fifth digits)

A0	1/10 W
18	1/8 W
16	1/6 W
14	1/4 W
12	1/2 W
01	1 W
02	2 W
03	3 W
04	4 W
05	5 W
06	6 W
07	7 W
75	7.5 W
08	8 W
10	10 W
15	15 W
A6	16 W
20	20 W
30	30 W

Tolerance (seventh digit)

F	±1 %
G	±2 %
J	±5 %
K	±10 %
M	±20 %
S	+20/−10%

Assistant code (twelfth digit)

A	Small type
B	Small type
S	Small type
Y	Lead tapping
Z	Lead tapping

Values (eighth — tenth or eleventh digits)

examples:

R47		0.47 Ω
4R7		4.7 Ω
470	47×10^0	47 Ω
471	47×10^1	470 Ω
472	47×10^2	4.7 kΩ
473	47×10^3	47 kΩ
474	47×10^4	470 kΩ
475	47×10^5	4.7 MΩ

QRV resistance shown by four digits:

4640	464×10^0	464 Ω
4641	464×10^1	4.64 kΩ
4642	464×10^2	46.4 kΩ

Shape of resistor (sixth digit)

Note: ■ indicates flame retardant resistor.

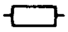
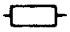
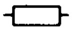
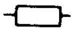
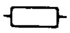
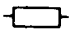
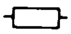
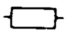
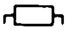
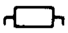
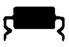
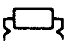
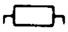
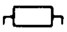
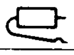
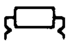
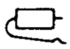
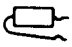
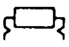
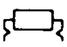
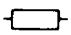
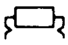
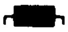
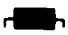
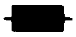
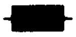
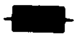
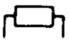
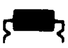
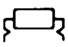
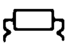
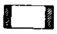
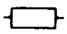
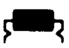
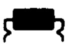
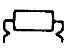
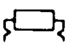
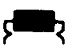
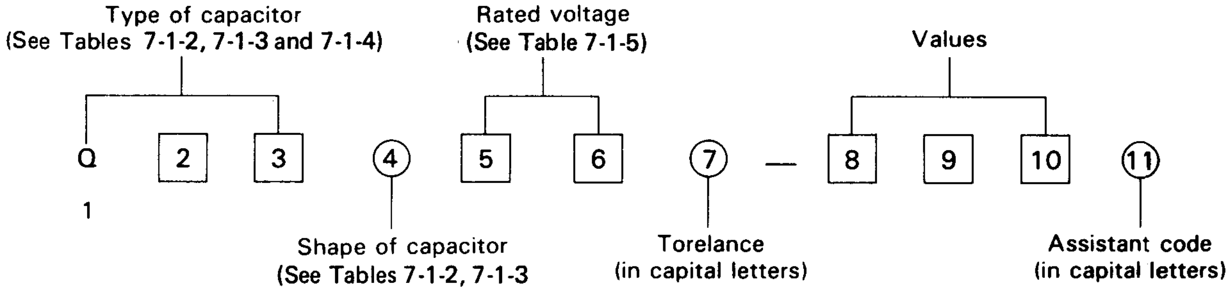
Type of resistor / Shape of resistor	C	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5									(L) type	
6										
7			Lug (B) type							
8			Lug (A) type				 Chip			
9			Lug (C) type							

Table 7-1-1

7.1.2 Fixed capacitor coding

Fixed capacitor part numbers are as follows.


Type of capacitor
(See Tables 7-1-2, 7-1-3 and 7-1-4)
Rated voltage
(See Table 7-1-5)
Values
Q
1
2
3
4
5
6
7
—
8
9
10
11
Shape of capacitor
(See Tables 7-1-2, 7-1-3
and 7-1-4)
Torelance
(in capital letters)
Assistant code
(in capital letters)

Ceramic capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial straight lead	Axial forming lead	Chip
QCB	Ceramic			B	C	
QCC	Ceramic	1	3	4	5	
QCD	High capacitance			B		8,A
QCF	High capacitance	1,4	3	B		8,A
QCS	Temperature compensation	1	3	4,B	5,C	8,A
QCT	Temperature compensation	Special coding				8,A
QCV	Ceramic			1,B	3,C	
QCX	Ceramic			1,B	3,C	
QCY	High capacitance	1,4,5	3	6	7	8,A
QCZ	Special type	Special coding				

Table 7-1-2

Electrolytic capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	5,B	6,C	9
QED	Miniature type		4	5	6	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum	8 (chip type)				
QEG	Low impedance		4			
QEK	Miniature type (ϕ5)		4,A	5,B	6,C	7
QEL	Small type				6	7
QEM	Small type		4,A	5,B	6,C	
QEN	Non-polar	2	4	5	6	7
QEP	Non-polar (small)	2	4,A	5,B	6,C	7
QER	Miniature type		4	5	6	7
QET	Normal	2	4,A	5,B	6,C	7
QEU	Small type		4	5	6	7
QEV	Small type		4	5	6	7
QEW	Normal	2	4	5	6	7
QEZ	Special type	Special coding				

Table 7-1-3

Paper film capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
		Tubular	Normal		Flame retardant	
Symbol	Characteristics		Mono-direction	Kink lead	Mono-direction	Kink lead
QFA	Metalized polypropylene	2	7			
QFE	Metalized mylar				5	
QFF	Film mica		4			
QFG	Polypropylene		4	8		
QFH	Metalized mylar	2	4,7,9	3,8	5	6
QFJ	Mylar (special)		4			
QFK	Metalized mylar (small)				5	
QFM	Mylar	2	4	3,7,8	5	6
QFN	Mylar (small)		4	3,8		
QFP	Polypropylene		4	3,8		
QFS	Polystyrole	2	4	3,8		
QFV	Thin film		4	7,8		
QFZ	Special type	Special coding				

Table 7-1-4

Rated voltage (fifth and sixth digits)

Sixth digit / Fifth digit	A	B	C	D	E	F	G	H	J	K	P	V	W	X
0						3.15	4.0	5(5.5)	6.3					
1	10	12	16	20	25		40	50	63	80		35		
2	100	125	160	200	250	315	400	500	630	800	180	350	450	600
3	1000	1250		2000				5000						

Table 7-1-5

Tolerance (seventh digit)

A	$^{+100}_{-10}$ %	M	± 20 %
F	± 1 %	N	± 30 %
G	± 2 %	P	$^{+100}_{-0}$ %
H	$^{+50}_{-10}$ %	R	$^{+30}_{-10}$ %
J	± 5 %	X	$^{+40}_{-20}$ %
K	± 10 %	Z	$^{+80}_{-20}$ %

Values (eighth – tenth digits)

Example : Values are in picofarads

R10 .... 0.1 pF

1R0 .... 1.0 pF

100 .... 10×10^0pF .... 10 pF

101 .... 10×10^1 pF .... 100 pF

102 .... 10×10^2 pF .... 1,000 pF (0.001 μF)

103 .... 10×10^3 pF .... 10,000 pF (0.01 μF)

104 .... 10×10^4 pF .... 100,000 pF (0.1 μF)

105 .... 10×10^5 pF .... 1 μF

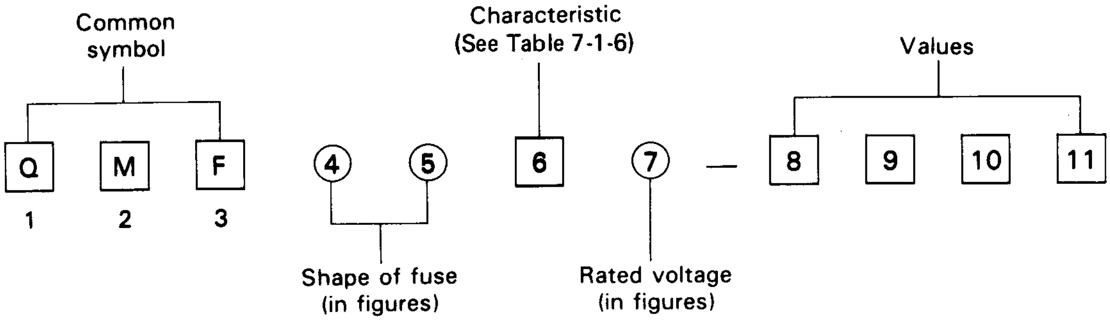
106 .... 10×10^6 pF .... 10 μF

Assistant code (eleventh digit)

A	Small size	X	Tapping
G	Small size	Y	Lead tapping
W	Tapping or Forming	Z	Lead tapping

7.1.3 Fuse coding

Standard fuse part numbers are as follows.


Common symbol
Characteristic (See Table 7-1-6)
Values
Q
M
F
④
⑤
6
⑦
—
8
9
10
11
1
2
3
Shape of fuse (in figures)
Rated voltage (in figures)

Shape of fuse
(fourth and fifth digits)

51	φ5.2 × 20 mm
53	φ5.2 × 20 mm with lead wires
60	φ6.4 × 30 mm
61	φ6.35 × 31.8 mm
63	φ6.4 × 30 mm with lead wires
66	φ6.35 × 31.8 mm with lead wires
00	Special type

Rated voltage
(seventh digit)

1	AC125 V
2	AC250 V

Values
(eighth-tenth or eleventh digits)
example:

R315	.... 0.315 A
R63	.... 0.63 A
1R0	.... 1.0 A
1R25	.... 1.25 A
2R5	.... 2.5 A
100	.... 10 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for CB and SEMKO)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO and CB)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, CSA and Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type (for UL, CSA and Japan)
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL and CSA)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type (for Japan)
	200 %	Within 2 min.	
S	135 %	Within 1 hr.	Anti-rush type (for Japan)
	200 %	Within 2 min.	
U	135 %	Within 1 hr.	Anti-rush type (for UL and CSA)
	200 %	Within 2 min.	

Table 7-1-6

6. MAIN BOARD ASSEMBLY <01>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB10037F-01	MAIN BOARD ASSY
	IC1	S-81252HG	IC
	IC2	M5236ML	IC
	IC3	BA6993F	IC
	IC101	BU3767K	IC
	IC102	M52434FP	IC
	IC103	M52410FP	IC
	IC104	VC5026G	IC
	IC105	BA226F	IC
	IC106	NJM2904E	IC
	OR	LM2904E	IC
	IC301	BA7757BK	IC
	IC302	NJM2904E	IC
	OR	LM2904E	IC
	IC401	M37412M4-004FP	IC
	OR	M37412E5-003FP	IC
	IC402	S-8054HN	IC
	IC403	BU4584BF	IC
	IC404	M54543ASL	IC
	Q1	2SB1009(PQ)	TRANSISTOR
	Q2	DTA124EU	TRANSISTOR
	Q3	DTC144EU	TRANSISTOR
	Q4	2SJ146	FE TRANSISTOR
	Q5	2SJ146	FE TRANSISTOR
	Q101	DTA124EU	TRANSISTOR
	Q102	2SK665	FE TRANSISTOR
	Q103	2SC4081(QRS)	TRANSISTOR
	Q104	DTC144EU	TRANSISTOR
	Q105	DTC144EU	TRANSISTOR
	Q106	DTC144EU	TRANSISTOR
	Q107	DTC144EU	TRANSISTOR
	Q108	DTC144EU	TRANSISTOR
	Q109	DTC144EU	TRANSISTOR
	Q110	DTC144EU	TRANSISTOR
	Q112	2SB798(MLK)	TRANSISTOR
	Q113	2SB798(MLK)	TRANSISTOR
	Q114	2SB798(MLK)	TRANSISTOR
	Q115	FMG2	TRANSISTOR
	Q116	DTC144EU	TRANSISTOR
	Q301	DTC144EU	TRANSISTOR
	Q302	DTA124EU	TRANSISTOR
	Q303	FMW3	TRANSISTOR
	Q304	2SC4097(QR)	TRANSISTOR
	Q305	2SC4097(QR)	TRANSISTOR
	Q306	2SA1036K(QR)	TRANSISTOR
	Q307	2SA1036K(QR)	TRANSISTOR
	Q308	DTC144EU	TRANSISTOR
	Q309	DTC144EU	TRANSISTOR
	Q310	DTC144EU	TRANSISTOR
	Q313	DTC144EU	TRANSISTOR
	Q401	2SA1576(QRS)	TRANSISTOR
	Q402	2SC4081(QRS)	TRANSISTOR
	Q403	2SK665	FE TRANSISTOR
	Q404	2SK665	FE TRANSISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q405	DTA124EU	TRANSISTOR
	Q406	2SA1576(QRS)	TRANSISTOR
	Q407	2SA1576(QRS)	TRANSISTOR
	Q409	DTC144EU	TRANSISTOR
	Q412	DTC144EU	TRANSISTOR
	Q420	2SA1576(QRS)	TRANSISTOR
	Q421	2SA1576(QRS)	TRANSISTOR
	Q422	2SA1576(QRS)	TRANSISTOR
	Q423	FMG2	TRANSISTOR
	D1	DAN202U	DIODE
	D2	FMN1	DIODE
	D101	RD8.2MB2	ZENER DIODE
	D102	DA204U	DIODE
	D103	MA141WK	DIODE
	D104	RB451F	DIODE
	D105	MA141WK	DIODE
	D106	MA141WK	DIODE
	D401	DA204U	DIODE
	D402	DAN202U	DIODE
	D403	DAP202U	DIODE
	D406	RB451F	DIODE
	D409	DAP202U	DIODE
	R1	NRSA63J-221N	RESISTOR
	R3	NRSA63J-822N	RESISTOR
	R4	NVP1301-102N	V RESISTOR,REG 8V
	R5	NRSA63J-104N	RESISTOR
	R6	NRSA63J-154N	RESISTOR
	R7	NRSA63J-104N	RESISTOR
	R8	NRSA63J-154N	RESISTOR
	R9	NRSA63J-104N	RESISTOR
	R11	NRSA63J-104N	RESISTOR
	R12	NRSA63J-104N	RESISTOR
	R13	NRSA63J-103N	RESISTOR
	R14	NRSA63J-103N	RESISTOR
	R15	NRSA63J-123N	RESISTOR
	R17	NRSA63J-105N	RESISTOR
	R19	NRSA63J-102N	RESISTOR
	R20	NRSA63J-824N	RESISTOR
	R21	NRSA63J-105N	RESISTOR
	R22	NRSA63J-824N	RESISTOR
	R101	YU40174-1-1	V RESISTOR,TRACKING
	R102	NRSA63J-102N	RESISTOR
	R103	NVP1301-103N	V RESISTOR,TRACKING PRESET
	R104	NRSA63J-102N	RESISTOR
	R105	NRSA63J-103N	RESISTOR
	R108	NVP1301-474N	V RESISTOR,PB SW POINT
	R109	NRSA63J-333N	RESISTOR
	R110	NRSA63J-123N	RESISTOR
	R113	NRSA63J-102N	RESISTOR
	R115	NRSA63J-105N	RESISTOR
	R116	NRSA63J-222N	RESISTOR
	R117	NRSA63J-104N	RESISTOR
	R118	NRSA63J-104N	RESISTOR
	R119	NRSA63J-104N	RESISTOR
	R120	NRSA63J-104N	RESISTOR
	R121	NRSA63J-473N	RESISTOR
	R122	NRSA63J-102N	RESISTOR
	R123	NRSA63J-273N	RESISTOR
	R124	NRSA63J-102N	RESISTOR
	R125	NRSA63J-102N	RESISTOR
	R126	NRSA63J-102N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R127	NRSA63J-102N	RESISTOR
	R128	NRSA63J-102N	RESISTOR
	R129	NRSA63J-102N	RESISTOR
	R130	NRSA63J-473N	RESISTOR
	R131	NRSA63J-473N	RESISTOR
	R133	NRSA63J-273N	RESISTOR
	R135	NRSA63J-682N	RESISTOR
	R136	NRSA63J-153N	RESISTOR
	R137	NRSA63J-223N	RESISTOR
	R138	NRSA63J-823N	RESISTOR
	R139	NRSA63J-105N	RESISTOR
	R140	NRSA63J-154N	RESISTOR
	R141	NRSA63J-184N	RESISTOR
	R145	NRSA63J-823N	RESISTOR
	R146	NRSA63J-274N	RESISTOR
	R147	NRSA63J-824N	RESISTOR
	R148	NRSA63J-154N	RESISTOR
	R149	NRSA63J-184N	RESISTOR
	R150	NRSA63J-103N	RESISTOR
	R151	NRSA63J-471N	RESISTOR
	R152	NRSA63J-103N	RESISTOR
	R153	NRSA63J-394N	RESISTOR
	R154	NRSA63J-334N	RESISTOR
	R155	NRSA63J-103N	RESISTOR
	R156	NRSA63J-224N	RESISTOR
	R158	NRSA63J-561N	RESISTOR
	R159	NRSA63J-561N	RESISTOR
	R160	NRSA63J-332N	RESISTOR
	R161	NRSA63J-332N	RESISTOR
	R162	NRSA63J-332N	RESISTOR
	R163	NRSA63J-332N	RESISTOR
	R164	NRSA63J-102N	RESISTOR
	R165	NRSA63J-102N	RESISTOR
	R166	NRSA63J-102N	RESISTOR
	R167	NRSA63J-102N	RESISTOR
	R169	NRSA63J-333N	RESISTOR
	R170	NRSA63J-473N	RESISTOR
	R171	NRSA63J-105N	RESISTOR
	R172	NRSA63J-103N	RESISTOR
	R173	NRSA63J-473N	RESISTOR
	R175	NRSA63J-472N	RESISTOR
	R176	NRSA63J-474N	RESISTOR
	R177	NRSA63J-103N	RESISTOR
	R178	NRSA63J-0R0A	RESISTOR
	R180	NRSA63J-560N	RESISTOR
	R181	NRSA63J-560N	RESISTOR
	R182	NRSA63J-683N	RESISTOR
	R183	NRSA63J-183N	RESISTOR
	R184	NRSA63J-103N	RESISTOR
	R185	NRSA63J-103N	RESISTOR
	R186	NRSA63J-103N	RESISTOR
	R190	NRSA63J-684N	RESISTOR
	R191	NRSA63J-222N	RESISTOR
	R196	NRSA63J-473N	RESISTOR
	R197	NRSA63J-473N	RESISTOR
	R198	NRSA63J-220N	RESISTOR
	R301	NRSA63J-302N	RESISTOR
	R303	NRSA63J-681N	RESISTOR
	R305	NRSA63J-100N	RESISTOR
	R306	NRSA63J-222N	RESISTOR
	R307	NRSA63J-103N	RESISTOR
	R308	NRSA63J-392N	RESISTOR
	R309	NVP1301-103N	V RESISTOR,PB AUDIO LEVEL
	R311	NRSA63J-124N	RESISTOR
	R312	NRSA63J-121N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R313	NRSA63J-223N	RESISTOR
	R314	NRSA63J-470N	RESISTOR
	R315	NRSA63J-185N	RESISTOR
	R316	NRSA63J-822N	RESISTOR
	R317	NRSA63J-223N	RESISTOR
	R318	NRSA63J-223N	RESISTOR
	R321	NRSA63J-222N	RESISTOR
	R322	NRSA63J-121N	RESISTOR
	R323	NRSA63J-273N	RESISTOR
	R324	NRSA63J-102N	RESISTOR
	R325	NRSA63J-0R0A	RESISTOR
	R326	NRSA63J-133N	RESISTOR
	R327	NRSA63J-123N	RESISTOR
	R328	NRSA63J-123N	RESISTOR
	R329	NRSA63J-123N	RESISTOR
	R330	NRSA63J-562N	RESISTOR
	R331	NRSA63J-272N	RESISTOR
	R332	NRSA63J-221N	RESISTOR
	R333	NRSA63J-124N	RESISTOR
	R334	NRSA63J-124N	RESISTOR
	R335	NRSA63J-4R7N	RESISTOR
	R336	NRSA63J-4R7N	RESISTOR
	R338	NRSA63J-221N	RESISTOR
	R339	NRSA63J-820N	RESISTOR
	R340	NRSA63J-0R0A	RESISTOR
	R341	NRSA63J-0R0A	RESISTOR
	R342	NVP1301-473N	V RESISTOR,BIAS GND
	R345	NRSA63J-103N	RESISTOR
	R346	NRSA63J-103N	RESISTOR
	R347	NRSA63J-470N	RESISTOR
	R349	NRVA62D-104N	RESISTOR
	R351	NRSA63J-472N	RESISTOR
	R352	NRVA62D-104N	RESISTOR
	R353	NRVA62D-513N	RESISTOR
	R355	NRSA63J-331N	RESISTOR
	R358	NRVA62D-513N	RESISTOR
	R359	NRVA62D-243N	RESISTOR
	R361	NRSA63J-331N	RESISTOR
	R362	NRSA63J-472N	RESISTOR
	R363	NRVA62D-513N	RESISTOR
	R365	NRSA63J-103N	RESISTOR
	R366	NRSA63J-820N	RESISTOR
	R367	NRSA63J-820N	RESISTOR
	R368	NRSA63J-103N	RESISTOR
	R372	NRSA63J-0R0A	RESISTOR
	R373	NRSA63J-0R0A	RESISTOR
	R401	NRSA63J-105N	RESISTOR
	R402	NRSA63J-153N	RESISTOR
	R403	NRSA63J-102N	RESISTOR
	R404	NRSA63J-472N	RESISTOR
	R405	NRSA63J-103N	RESISTOR
	R406	NRSA63J-472N	RESISTOR
	R407	NRSA63J-104N	RESISTOR
	R408	NRSA63J-473N	RESISTOR
	R409	NRSA63J-102N	RESISTOR
	R410	NRSA63J-103N	RESISTOR
	R411	NRSA63J-102N	RESISTOR
	R412	NRSA63J-103N	RESISTOR
	R413	NRSA63J-102N	RESISTOR
	R414	NRSA63J-333N	RESISTOR
	R415	NRSA63J-102N	RESISTOR
	R416	NRSA63J-823N	RESISTOR
	R417	NRSA63J-102N	RESISTOR
	R418	NRSA63J-103N	RESISTOR
	R419	NRSA63J-102N	RESISTOR
	R420	NRSA63J-203N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R421	NRSA63J-203N	RESISTOR
	R422	NRSA63J-203N	RESISTOR
	R423	NRSA63J-103N	RESISTOR
	R424	NRSA63J-103N	RESISTOR
	R425	NRSA63J-203N	RESISTOR
	R426	NRSA63J-153N	RESISTOR
	R427	NRSA63J-102N	RESISTOR
	R428	NRSA63J-105N	RESISTOR
	R429	NRSA63J-102N	RESISTOR
	R430	NRSA63J-563N	RESISTOR
	R431	NRSA63J-472N	RESISTOR
	R432	NRSA63J-203N	RESISTOR
	R433	NRSA63J-203N	RESISTOR
	R434	NRSA63J-203N	RESISTOR
	R435	NRSA63J-103N	RESISTOR
	R436	NRSA63J-103N	RESISTOR
	R437	NRSA63J-203N	RESISTOR
	R438	NRSA63J-102N	RESISTOR
	R439	NRSA63J-102N	RESISTOR
	R440	NRVA62D-683N	RESISTOR
	R441	NRVA62D-103N	RESISTOR
	R442	NRVA62D-683N	RESISTOR
	R443	QRSA08J-0R0Y	RESISTOR
	R444	NRSA63J-153N	RESISTOR
	R445	NRSA63J-102N	RESISTOR
	R446	NRSA63J-153N	RESISTOR
	R447	NRSA63J-102N	RESISTOR
	R448	NRSA63J-104N	RESISTOR
	R450	NRSA63J-103N	RESISTOR
	R451	NRSA63J-471N	RESISTOR
	R452	NRSA63J-153N	RESISTOR
	R453	NRSA63J-102N	RESISTOR
	R454	NRSA63J-153N	RESISTOR
	R455	NRSA63J-102N	RESISTOR
	R456	NRSA63J-102N	RESISTOR
	R457	NRSA63J-473N	RESISTOR
	R458	NRSA63J-273N	RESISTOR
	R460	NRSA63J-0R0A	RESISTOR
	R461	NRSA63J-102N	RESISTOR
	R462	NRSA63J-102N	RESISTOR
	R463	NRSA63J-102N	RESISTOR
	R464	NRSA63J-271N	RESISTOR
	R465	NRSA63J-332N	RESISTOR
	R466	NRSA63J-152N	RESISTOR
	R467	NRSA63J-392N	RESISTOR
	R468	NRSA63J-473N	RESISTOR
	R469	NRSA63J-473N	RESISTOR
	R470	NRSA63J-103N	RESISTOR
	R471	NRSA63J-103N	RESISTOR
	R472	NRSA63J-103N	RESISTOR
	R473	NRSA63J-153N	RESISTOR
	R474	NRSA63J-473N	RESISTOR
	R475	NRSA63J-473N	RESISTOR
	R476	NRSA63J-105N	RESISTOR
	R477	NRSA63J-102N	RESISTOR
	R478	NRSA63J-472N	RESISTOR
	R479	NRSA63J-472N	RESISTOR
	R480	NRSA63J-105N	RESISTOR
	R481	NRSA63J-0R0A	RESISTOR
	R482	NRSA63J-223N	RESISTOR
	R485	NRSA63J-103N	RESISTOR
	R488	NRSA63J-104N	RESISTOR
	R489	NRSA63J-105N	RESISTOR
	R491	NRSA63J-102N	RESISTOR
	R492	NRSA63J-333N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R501	NRSA63J-473N	RESISTOR
	R502	NRSA63J-102N	RESISTOR
	R504	NRSA63J-153N	RESISTOR
	R505	NRSA63J-103N	RESISTOR
	R506	NRSA63J-103N	RESISTOR
	R507	NRSA63J-472N	RESISTOR
	R508	NRSA63J-102N	RESISTOR
	R509	NRSA63J-103N	RESISTOR
	R510	NRSA63J-152N	RESISTOR
	R511	NRSA63J-332N	RESISTOR
	R512	NRSA63J-103N	RESISTOR
	R513	NRSA63J-105N	RESISTOR
	R515	NRSA63J-0R0A	RESISTOR
	R516	NRSA63J-153N	RESISTOR
	B101	NRSA63J-0R0A	RESISTOR
	B102	NRSA63J-0R0A	RESISTOR
	B103	NRSA63J-0R0A	RESISTOR
	B110	NRSA63J-0R0A	RESISTOR
	C1	QEKA1CM-476	E CAPACITOR
	C2	QEKA1CM-476	E CAPACITOR
	C3	QEDF1CM-476	E CAPACITOR
	OR	QED41CM-476	E CAPACITOR
	C4	QEDF1CM-476	E CAPACITOR
	OR	QED41CM-476	E CAPACITOR
	C5	QEDF1AM-826	E CAPACITOR
	OR	QED41AM-826	E CAPACITOR
	C6	QEDF1AM-826	E CAPACITOR
	OR	QED41AM-826	E CAPACITOR
	C7	QEDF1AM-826	E CAPACITOR
	OR	QED41AM-826	E CAPACITOR
	C8	QCY81EK-473ZL	CAPACITOR
	OR	QCY81EK-473	CAPACITOR
	C9	QEDF1AM-826	E CAPACITOR
	OR	QED41AM-826	E CAPACITOR
	C10	QCFA1EZ-104	CAPACITOR
	C15	QEF81EM-474	TANTAL CAPACITOR
	C16	QEEF1DM-226	TANTAL CAPACITOR
	OR	QEE81DM-226	TANTAL CAPACITOR
	C101	QFZ9011-683Z	MM CAPACITOR
	C103	NCB31HK-392A	CAPACITOR
	C104	NCT06CH-270A	CAPACITOR
	C105	NCT06CH-270A	CAPACITOR
	C107	QERF1CM-106	E CAPACITOR
	C108	QCF81CZ-105	CAPACITOR
	C109	NCB31EK-103A	CAPACITOR
	C110	NCB31HK-562A	CAPACITOR
	C111	NCB31EK-103A	CAPACITOR
	C112	NCB31HK-102A	CAPACITOR
	C115	NCB31HK-222A	CAPACITOR
	C116	QFZ9011-104Z	MM CAPACITOR
	C117	QENF1CM-106	NP E.CAP
	C120	NCB31HK-222A	CAPACITOR
	C121	QFZ0096-224Z	MM CAPACITOR
	C122	QENF1CM-106	NP E.CAP
	C123	QCSA1HJ-102	CAPACITOR
	C124	QCSA1HJ-102	CAPACITOR
	C125	NCB31EK-103A	CAPACITOR
	C130	QCFA1EZ-104	CAPACITOR
	C136	QCF81CZ-105	CAPACITOR
	C137	QCF81CZ-105	CAPACITOR
	C138	NCB31HK-102A	CAPACITOR
	C140	NCF31CZ-104A	CAPACITOR
	C141	NCS31HJ-100A	CAPACITOR
	C142	NCF31CZ-104A	CAPACITOR
	C143	NCB31HK-102A	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C144	NCB31HK-471A	CAPACITOR
	C145	NCB31HK-102A	CAPACITOR
	C146	NCF31CZ-104A	CAPACITOR
	C148	NCB31HK-562A	CAPACITOR
	C149	QCF81CZ-105	CAPACITOR
	C150	QCF81CZ-105	CAPACITOR
	C151	NCS31HJ-101A	CAPACITOR
	C155	NCB31EK-103A	CAPACITOR
	C156	NCB31EK-103A	CAPACITOR
	C157	QERF1AM-336	E CAPACITOR
	C158	QERF1AM-336	E CAPACITOR
	C159	QERF1AM-336	E CAPACITOR
	C160	QCF81CZ-105	CAPACITOR
	C161	QCYA1EK-223	CAPACITOR
	C162	QCYA1EK-223	CAPACITOR
	C163	QCYA1EK-223	CAPACITOR
	C165	QFZ9011-333Z	MM CAPACITOR
	C166	QCF81CZ-105	CAPACITOR
	C301	QERF1HM-474	E CAPACITOR
	C303	QERF1CM-106	E CAPACITOR
	C304	QERF1HM-224	E CAPACITOR
	C306	QERF0JM-336	E CAPACITOR
	C307	QERF1AM-226	E CAPACITOR
	C308	QCYA1EK-223	CAPACITOR
	C309	NCB31HK-681A	CAPACITOR
	C311	QERF1HM-105	E CAPACITOR
	C312	QERF0JM-336	E CAPACITOR
	C313	QENF0JM-226	NP E.CAP
	C314	QER41HM-105	E CAPACITOR
	C315	QERF1CM-106	E CAPACITOR
	C316	QERF1CM-106	E CAPACITOR
	C318	QER40JM-226	E CAPACITOR
	C320	QERF1HM-105	E CAPACITOR
	C322	NCB31HK-471A	CAPACITOR
	C323	NCB31HK-682A	CAPACITOR
	C324	NCB31HK-682A	CAPACITOR
	C325	QFZ9011-333Z	MM CAPACITOR
	C326	QERF1AM-476	E CAPACITOR
	C330	NCR31CK-223A	CAPACITOR
	C331	NCB31HK-122A	CAPACITOR
	C332	NCB31HK-472A	CAPACITOR
	C334	NCB31HK-682A	CAPACITOR
	C336	NCB31HK-682A	CAPACITOR
	C338	NCS31HJ-221A	CAPACITOR
	C340	NCT08CH-101A	CAPACITOR
	C341	NCT08CH-101A	CAPACITOR
	C342	NCT08CH-101A	CAPACITOR
	C343	NCT08CH-101A	CAPACITOR
	C344	NCT08CH-101A	CAPACITOR
	C345	NCT08CH-101A	CAPACITOR
	C346	NCT08CH-101A	CAPACITOR
	C347	NCT08CH-101A	CAPACITOR
	C401	QERF1EM-475	E CAPACITOR
	C402	QCFA1EZ-104	CAPACITOR
	C403	QER41EM-475	E CAPACITOR
	C404	NCS31HJ-330A	CAPACITOR
	C405	NCS31HJ-330A	CAPACITOR
	C407	NCB31HK-332A	CAPACITOR
	C408	NCB31HK-472A	CAPACITOR
	C409	QCFA1EZ-333	CAPACITOR
	C411	NCB31EK-103A	CAPACITOR
	C412	QEF81CM-335	E CAPACITOR
	C413	QCFA1EZ-104	CAPACITOR
	C414	QCYA1HK-103	CAPACITOR
	C415	YU40470-103	CAPACITOR
	L1	PU56181-470	COIL
	L2	PU56181-470	COIL
	L3	YU40248-470KY	COIL
	L302	PU56197-2-P	EQUALIZER
⚠	L303	YU41077	BIAS OSC COIL
	L304	PU59188-221K	COIL
	L401	YU40248-470KY	COIL

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	TRAP101	AFZ74A002X1	TRAP
⚠	X1	YU40404	CRYSTAL RESONATOR
⚠	CF401	YU40560	CRYSTAL RESONATOR
	DD1	YU40169-03	DC-DC CONVERTER
	CL1	YU40245-02	WIRE CLAMP
	HS1	YU40466-1-3	HEAT SINK
	SCW1	YQ40578	SCREW
	SLD1	YQ41150	SHIELD PLATE
	SLD2	YQ40890	SHEET
	SLD3	YU40467	INSULATOR
	WR1	YU40705-03	WIRE
	TP1	YU40581-AY	CHIP TP(2125)
	TP2	YU40581-AY	CHIP TP(2125)
	TP3	YU40581-AY	CHIP TP(2125)
	TP4	PU54983	TEST PIN
	TP5	PU54983	TEST PIN
	TP101	YU40581-AY	CHIP TP(2125)
	TP104	YU40581-AY	CHIP TP(2125)
	TP105	YU40581-AY	CHIP TP(2125)
	TP106	YU40581-AY	CHIP TP(2125)
	TP107	YU40581-AY	CHIP TP(2125)
	TP108	YU40581-AY	CHIP TP(2125)
	TP109	YU40581-AY	CHIP TP(2125)
	TP110	YU40581-AY	CHIP TP(2125)
	TP111	YU40581-AY	CHIP TP(2125)
	TP302	YU40581-AY	CHIP TP(2125)
	TP303	YU40581-AY	CHIP TP(2125)
	TP304	YU40581-AY	CHIP TP(2125)
	CN1	YU40101-12	CAP HOUSING,(BOARD TO BOARD)
	CN2	YU40108-6	CAP HOUSING
	CN3	YU40773-14	CAP HOUSING,(BOARD TO BOARD)
	CN4	YU40683-16	CAP HOUSING,(BOARD TO BOARD)
	CN5	YU40096-4	CAP HOUSING
	CN6	YU40106-13	CAP HOUSING
	CN7	YU40106-10	CAP HOUSING
	CN8	YU40096-7	CAP HOUSING
	CN9	YU40096-6	CAP HOUSING
	CN10	YU40096-7	CAP HOUSING
	CN11	YU40096-3Y	CAP HOUSING
	CN12	YU40096-3	CAP HOUSING
	CN13	YU40096-9	CAP HOUSING
	CN14	YU40108-15	CAP HOUSING
	CN15	YU40102-14	CAP HOUSING,(BOARD TO BOARD)
	CN16	YU40102-8	CAP HOUSING,(BOARD TO BOARD)
	CN17	YU40102-10	CAP HOUSING,(BOARD TO BOARD)
⚠	CP1	ICP-F15	CIRCUIT PROTECTOR
⚠	CP2	ICP-F15	CIRCUIT PROTECTOR
⚠	CP3	ICP-F15	CIRCUIT PROTECTOR
⚠	CP4	ICP-F15	CIRCUIT PROTECTOR
⚠	CP5	ICP-F20	CIRCUIT PROTECTOR

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7. Y/C BOARD ASSEMBLY <02>

	PWBA	YB10031A-01	Y/C BOARD ASSY
	IC1	BA7288K	IC
	IC2	LA7330	IC
	IC3	MSM6965-3MS	IC
	IC4	AN8009	IC
	Q1	2SA1576	TRANSISTOR
	Q2	DTC144EU	TRANSISTOR
	Q3	DTC144EU	TRANSISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q4	2SC4081	TRANSISTOR
	Q5	2SA1576	TRANSISTOR
	Q6	2SC4081	TRANSISTOR
	Q7	2SC4081	TRANSISTOR
	Q8	2SC4081	TRANSISTOR
	Q9	2SC4081	TRANSISTOR
	Q10	2SC4081	TRANSISTOR
	Q11	2SA1576	TRANSISTOR
	Q12	2SB624-T1BBV4	TRANSISTOR
	Q13	2SB624-T1BBV4	TRANSISTOR
	Q14	DTC144EU	TRANSISTOR
	Q15	FMW1	TRANSISTOR
	Q16	2SB624-T1BBV4	TRANSISTOR
	Q17	DTA144EU	TRANSISTOR
	Q18	DTC144EU	TRANSISTOR
	Q19	2SC4081	TRANSISTOR
	Q20	2SC4081	TRANSISTOR
	Q25	2SB624-T2BBV4	TRANSISTOR
	Q26	DTC144EU	TRANSISTOR
	Q27	2SC4081	TRANSISTOR
	Q28	2SC4081(QRS)	TRANSISTOR
	D1	DAN202U	DIODE
	D2	DA204U	DIODE
	D3	DAN202U	DIODE
	D4	DAN202U	DIODE
	D5	DAN202U	DIODE
	D6	DA204U	DIODE
	D7	DAN202U	DIODE
	D8	1SS133	DIODE
	R1	NRSA63J-272N	RESISTOR
	R2	NRSA63J-222N	RESISTOR
	R3	NRSA63J-104N	RESISTOR
	R4	NRSA63J-102N	RESISTOR
	R5	NRSA63J-102N	RESISTOR
	R6	QRSA08J-152YN	RESISTOR
	R7	NRSA63J-563N	RESISTOR
	R9	NRSA63J-222N	RESISTOR
	R10	NRSA63J-103N	RESISTOR
	R11	NRSA63J-273N	RESISTOR
	R12	NRSA63J-153N	RESISTOR
	R13	NRSA63J-273N	RESISTOR
	R14	NRSA63J-153N	RESISTOR
	R15	NRSA63J-103N	RESISTOR
	R16	NRSA63J-102N	RESISTOR
	R17	NRSA63J-152N	RESISTOR
	R18	NRSA63J-203N	RESISTOR
	R19	NRSA63J-203N	RESISTOR
	R20	NRSA63J-331N	RESISTOR
	R22	NRSA63J-272N	RESISTOR
	R23	NRSA63J-102N	RESISTOR
	R24	NRSA63J-333N	RESISTOR
	R25	NRSA63J-153N	RESISTOR
	R26	NRSA63J-471N	RESISTOR
	R27	NRSA63J-472N	RESISTOR
	R28	NRSA63J-0R0A	RESISTOR
	R29	NRSA63J-824N	RESISTOR
	R30	NRSA63J-121N	RESISTOR
	R31	NRSA63J-121N	RESISTOR
	R32	NRSA63J-271N	RESISTOR
	R33	NRSA63J-102N	RESISTOR
	R34	NRSA63J-102N	RESISTOR
	R35	NRSA63J-152N	RESISTOR
	R36	NRSA63J-822N	RESISTOR
	R37	NRSA63J-102N	RESISTOR
	R38	NRSA63J-822N	RESISTOR
	R39	NRSA63J-821N	RESISTOR
	R40	NRSA63J-272N	RESISTOR
	R41	NRSA63J-271N	RESISTOR
	R42	NRSA63J-122N	RESISTOR
	R43	NRSA63J-681N	RESISTOR
	R44	NRSA63J-331N	RESISTOR
	R45	NRSA63J-102N	RESISTOR
	R46	NRSA63J-101N	RESISTOR
	R47	NRSA63J-102N	RESISTOR
	R48	NRSA63J-102N	RESISTOR
	R49	NRSA63J-182N	RESISTOR
	R50	NRSA63J-152N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R51	NRSA63J-102N	RESISTOR
	R52	NRSA63J-821N	RESISTOR
	R53	NRSA63J-333N	RESISTOR
	R54	NRSA63J-153N	RESISTOR
	R55	NRSA63J-821N	RESISTOR
	R56	NRSA63J-391N	RESISTOR
	R57	NRSA63J-391N	RESISTOR
	R58	NRSA63J-222N	RESISTOR
	R59	NRSA63J-222N	RESISTOR
	R60	NRSA63J-102N	RESISTOR
	R61	NRSA63J-332N	RESISTOR
	R62	NRSA63J-152N	RESISTOR
	R63	NRSA63J-332N	RESISTOR
	R64	NRSA63J-152N	RESISTOR
	R68	NRSA63J-333N	RESISTOR
	R69	NRSA63J-122N	RESISTOR
	R70	NRSA63J-0R0N	RESISTOR
	R71	NRSA63J-104N	RESISTOR
	R72	NRSA63J-822N	RESISTOR
	R73	NRSA63J-223N	RESISTOR
	R74	NRSA63J-681N	RESISTOR
	R75	NRSA63J-151N	RESISTOR
	R76	NRSA63J-332N	RESISTOR
	R77	NRSA63J-151N	RESISTOR
	R79	NRSA63J-122N	RESISTOR
	R80	NRSA63J-223N	RESISTOR
	R81	NRSA63J-102N	RESISTOR
	R82	NRSA63J-102N	RESISTOR
	R83	NRSA63J-102N	RESISTOR
	R84	NRSA63J-392N	RESISTOR
	R85	NRSA63J-152N	RESISTOR
	R86	NRSA63J-391N	RESISTOR
	R87	NRSA63J-151N	RESISTOR
	R88	NRSA63J-122N	RESISTOR
	R89	NRSA63J-471N	RESISTOR
	R90	NRSA63J-122N	RESISTOR
	R91	QRD161J-101	RESISTOR
	R101	NRSA63J-333N	RESISTOR
	R102	NRSA63J-152N	RESISTOR
	R111	NRSA63J-562N	RESISTOR
	R112	NRSA63J-821N	RESISTOR
	R113	NRSA63J-473N	RESISTOR
	R114	NRSA63J-102N	RESISTOR
	R115	NRSA63J-102N	RESISTOR
	R120	QRD161J-473	RESISTOR
	R121	QRD161J-473	RESISTOR
	R150	NVP1301-103N	V RESISTOR, EE Y LEVEL
	R151	NVP1301-103N	V RESISTOR, EE BURST LEVEL
	R152	NVP1301-103N	V RESISTOR, DEVIATION
	R153	NVP1301-473N	V RESISTOR, CARRIER
	R154	NVP1301-104N	V RESISTOR, WHITE CLIP LEVEL
	R155	NVP1301-104N	V RESISTOR, DARK CLIP LEVEL
	R156	NVP1301-473N	V RESISTOR, PB Y LEVEL
	R157	NVP1301-102N	V RESISTOR, PB 1H DL DEMOD LEVEL
	R158	NVP1301-222N	V RESISTOR, REC FM LEVEL
	R159	NVP1301-222N	V RESISTOR, PB RF EQ
	R160	NVP1301-102N	V RESISTOR, PB BURST LEVEL
	R161	NVP1301-331N	V RESISTOR, REC COLOR LEVEL
	R162	NVP1301-102N	V RESISTOR, PB ACC INPUT LEVEL
	B1	NRSA63J-0R0A	RESISTOR
	B2	NRSA63J-0R0A	RESISTOR
	B3	NRSA63J-0R0A	RESISTOR
	C1	QEKA0HM-477	E CAPACITOR
	C2	QER61HM-105GZ	E CAPACITOR
	C3	QCYA1EK-223	CAPACITOR
	C4	QEE41CM-476	E CAPACITOR
	C6	NCS31HJ-101A	CAPACITOR
	C7	NCB31EK-103A	CAPACITOR
	C8	NCB31EK-103A	CAPACITOR
	C9	NCB31EK-103A	CAPACITOR
	C10	QCSA1HJ-391	CAPACITOR
	C12	QER61CM-106GZ	E CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C14	QER61CM-106GZ	E CAPACITOR
	C15	NCS31HJ-101A	CAPACITOR
	C16	NCS31HJ-470A	CAPACITOR
	C17	NCB31EK-103A	CAPACITOR
	C18	NCB31EK-103A	CAPACITOR
	C19	QCYA1EK-223	CAPACITOR
	C20	QCYA1HK-332	CAPACITOR
	C21	NCB31EK-103A	CAPACITOR
	C22	QER61EM-335GZ	E CAPACITOR
	C23	QER61CM-475GZ	E CAPACITOR
	C24	QER61HM-224GZ	E CAPACITOR
	C25	QER61EM-335GZ	E CAPACITOR
	C26	NCB31EK-103A	CAPACITOR
	C27	QER61CM-476GZ	E CAPACITOR
	C28	NCS31HJ-390A	CAPACITOR
	C29	NCB31EK-103A	CAPACITOR
	C30	NCB31EK-103A	CAPACITOR
	C31	QER61HM-334GZ	E CAPACITOR
	C32	QER61CM-475GZ	E CAPACITOR
	C33	QER61CM-476GZ	E CAPACITOR
	C34	QCYA1EK-223	CAPACITOR
	C35	QEE41CM-476	TANTAL CAPACITOR
	C36	QCYA1EK-223	CAPACITOR
	C37	QCYA1EK-223	CAPACITOR
	C38	QER61CM-476GZ	E CAPACITOR
	C39	NCB31EK-103A	CAPACITOR
	C40	NCS31HJ-121A	CAPACITOR
	C41	NCS31HJ-470A	CAPACITOR
	C42	NCB31EK-103A	CAPACITOR
	C43	NCS31HJ-330A	CAPACITOR
	C44	NCS31HJ-221A	CAPACITOR
	C45	NCS31HJ-121A	CAPACITOR
	C46	NCS31HJ-470A	CAPACITOR
	C47	NCB31EK-103A	CAPACITOR
	C48	NCS31HJ-560A	CAPACITOR
	C49	NCS31HJ-181A	CAPACITOR
	C50	NCS31HJ-390A	CAPACITOR
	C51	NCB31EK-103A	CAPACITOR
	C52	NCS31HJ-270A	CAPACITOR
	C53	NCB31EK-103A	CAPACITOR
	C54	NCS31HJ-121A	CAPACITOR
	C55	QER61CM-476GZ	E CAPACITOR
	C56	QCYA1EK-223	CAPACITOR
	C59	QCFA1EZ-104	CAPACITOR
	C60	QEK61AM-107	E CAPACITOR
	C61	NCB31EK-103A	CAPACITOR
	C62	NCS31HJ-150A	CAPACITOR
	C63	NCS31HJ-101A	CAPACITOR
	C64	QCYA1EK-223	CAPACITOR
	C65	QEE81AM-476	T.CAP
	C66	NCS31HJ-331A	CAPACITOR
	C67	NCS31HJ-100A	CAPACITOR
	C68	NCS31HJ-330A	CAPACITOR
	C69	NCB31EK-103A	CAPACITOR
	C70	QER61HM-105GZ	E CAPACITOR
	C71	NCB31EK-103A	CAPACITOR
	C72	NCB31EK-103A	CAPACITOR
	C73	NCS31HJ-151A	CAPACITOR
	C75	NCS31HJ-150A	CAPACITOR
	C76	NCS31HJ-151A	CAPACITOR
	C77	NCR21CK-473A	CAPACITOR
	C79	QCYA1EK-223	CAPACITOR
	C80	QER61HM-105GZ	E CAPACITOR
	C81	QER61HM-105GZ	E CAPACITOR
	C82	NCB31EK-103A	CAPACITOR
	C83	QCYA1HK-153	CAPACITOR
	C84	QCYA1HK-333	CAPACITOR
	C85	QCYA1HK-333	CAPACITOR
	C86	NCB31HK-272A	CAPACITOR
	C87	NCS31HJ-820A	CAPACITOR
	C88	NCS31HJ-100A	CAPACITOR
	C89	NCS31HJ-820A	CAPACITOR
	C90	NCB31EK-103A	CAPACITOR
	C91	QER61HM-105GZ	E CAPACITOR
	C92	QCYA1EK-223	CAPACITOR
	C93	NCB31EK-103A	CAPACITOR
	C94	NCB31EK-103A	CAPACITOR
	C95	NCB31EK-103A	CAPACITOR
	C97	QER61CM-106GZ	E CAPACITOR
	C98	NCB31EK-103A	CAPACITOR
	C100	QCFA1EZ-104	CAPACITOR
	C101	QEK61AM-107	E CAPACITOR
	C102	QCSA1HJ-820	CAPACITOR
	C103	NCB31EK-103A	CAPACITOR
	C104	QER61CM-476GZ	E CAPACITOR
	C106	NCS31HJ-3R0A	CAPACITOR
	C111	NCB31EK-103A	CAPACITOR
	C112	NCB31EK-103A	CAPACITOR
	C115	QCVB1CM-103	CAPACITOR
	L1	YU40589-470JY	COIL
	L3	PU59152-560J	COIL
	L4	PU59152-100J	COIL
	L5	YU40589-470JY	COIL
	L6	PU59152-121J	COIL
	L7	PU59152-150J	COIL
	L8	PU59152-220J	COIL
	L9	YU40589-271JY	COIL
	L10	PU59152-680J	COIL
	L11	PU59152-180J	COIL
	L12	YU40589-331JY	COIL
	L13	PU59152-820J	COIL
	L14	PU59152-220J	COIL
	L15	PU59152-560J	COIL
	L16	PU59152-680J	COIL
	L17	YU40589-470JY	COIL
	L18	YU40589-470JY	COIL
	L19	YU40589-470JY	COIL
	L20	PU59152-470J	COIL
	L21	PU59152-1R0J	COIL
	L22	PU59152-180J	COIL
	L23	PU59152-181J	COIL
	L24	PU59152-470J	COIL
	L25	PU53607-682	COIL
	L26	YU40589-331JY	COIL
	L27	YU40589-102JY	COIL
	L28	YU40589-271JY	COIL
	L29	PU59152-150J	COIL
	L30	YU40589-470JY	COIL
	L31	YU40589-470JY	COIL
	L35	YU40589-221JY	COIL
	L36	YU40589-331JY	COIL
	L41	YU40589-470JY	COIL
	EQ1	YU40942	EQUALIZER
	EQ2	YU41131	EQUALIZER
		OR YU41228	EQUALIZER
	LPF1	YU40944	LOW PASS FILTER
	LPF2	YU40945	LOW PASS FILTER
	BPF1	YU40946	BAND PASS FILTER
	BPF2	YU41019	BAND PASS FILTER
	DL1	YU40948	2H DELAY LINE
⚠	X1	YU40814	CRYSTAL RESONATOR
	TP1	YU40581-AY	CHIP TP(2125)
	TP2	YU40581-AY	CHIP TP(2125)
	TP3	YU40581-AY	CHIP TP(2125)
	TP4	YU40581-AY	CHIP TP(2125)
	TP6	YU40581-AY	CHIP TP(2125)
	TP7	YU40581-AY	CHIP TP(2125)
	TP9	PU56278	TEST PIN
	TP10	YU40581-AY	CHIP TP(2125)
	TP11	PU56278	TEST PIN
	TP12	PU56278	TEST PIN
	TP13	YU40581-AY	CHIP TP(2125)
	CN4	YU40105-10	CAP HOUSING
	CN5	YU40105-14	CAP HOUSING
	CN7	YU40684-10	CAP HOUSING
	CN8	YU40105-8	CAP HOUSING

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8. DRUM MDA BOARD ASSEMBLY <03>

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB201038	DRUM MDA BOARD ASSY
	IC1	BA6452F	IC
	D1	MA141WK	DIODE
	R1	QRSA08J-102YN	RESISTOR
	R2	QRSA08J-104YN	RESISTOR
	R3	QRSA08J-153YN	RESISTOR
	R4	QRSA08J-222YN	RESISTOR
	R5	QRSA08J-121YN	RESISTOR
	R6	QRSA08K-2R2YN	RESISTOR
	R7	QRSA08K-2R2YN	RESISTOR
	R8	QRSA08K-2R2YN	RESISTOR
	R9	QRSA08J-104YN	RESISTOR
	R10	QRSA08J-0R0Y	RESISTOR
	R11	QRG12BJ-R68AR	MF RESISTOR
	C1	QCFA1EZ-104	CAPACITOR
	C2	QCYA1HK-471	CAPACITOR
	C3	QCY81CK-224	CAPACITOR
	C4	QCFA1EZ-104	CAPACITOR
	C5	QCYA1EK-223	CAPACITOR
	C6	QERF1CM-106	E CAPACITOR
	C7	QERF1CM-106	E CAPACITOR
	C8	QERF1CM-106	E CAPACITOR
	C9	QCFA1EZ-104	CAPACITOR
	C10	QERF1CM-106	E CAPACITOR
	C11	QERF1CM-106	E CAPACITOR
	S1	YU40177	PUSH SWITCH
	SLD 1	YU41030	SHEET
	CN1	YU40682-16	CAP HOUSING,(BOARD TO BOARD)
	CN2	YU40107-15	CAP HOUSING
	CN3	YU40096-2Y	CAP HOUSING
	CN4	YU40096-2	CAP HOUSING
	CN6	YU40096-2	CAP HOUSING

* * *

9. PRE/REC AMP BOARD ASSEMBLY <04>

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	BW7652	PRE/REC AMP MODULE
	IC1	M51499FD	IC
	Q1	FMY1	TRANSISTOR
	Q2	FMY1	TRANSISTOR
	Q3	FMY1	TRANSISTOR
	Q4	FMY1	TRANSISTOR
	Q9	2SC4117	TRANSISTOR
	Q10	2SC4117	TRANSISTOR
	Q11	2SC4117	TRANSISTOR
	Q12	2SC4117	TRANSISTOR
	Q13	DTC144WU	TRANSISTOR
	R1	NRSA63J-103NY	RESISTOR
	R2	NRSA63J-103NY	RESISTOR
	R3	NRSA63J-103NY	RESISTOR
	R4	NRSA63J-103NY	RESISTOR
	R5	NRSA63J-332NY	RESISTOR
	R6	NRSA63J-332NY	RESISTOR
	R7	NRSA63J-332NY	RESISTOR
	R8	NRSA63J-332NY	RESISTOR
	R9	NRSA63J-332NY	RESISTOR
	R10	NRSA63J-332NY	RESISTOR
	R11	NRSA63J-332NY	RESISTOR
	R12	NRSA63J-332NY	RESISTOR
	R13	NRSA63J-102NY	RESISTOR
	R14	NRSA63J-102NY	RESISTOR
	R15	NRSA63J-102NY	RESISTOR
	R16	NRSA63J-102NY	RESISTOR
	R17	NRSA63J-820NY	RESISTOR
	R25	NRSA63J-103NY	RESISTOR
	R26	NRSA63J-103NY	RESISTOR
	R27	NRSA63J-103NY	RESISTOR
	R28	NRSA63J-103NY	RESISTOR
	R29	–	–
	R30	–	–
	R31	NRSA63J-102NY	RESISTOR
	R32	NRSA63J-102NY	RESISTOR
	R33	NRSA63J-223NY	RESISTOR
	R34	—	—
	R35	NRSA63J-102NY	RESISTOR
	VR1	YTU93026-001	V. RESISTOR, Q 3 ch
	VR2	YTU93026-002	V. RESISTOR, Q 1 ch
	VR3	YTU93026-003	V. RESISTOR, Q 4 ch
	VR4	YTU93026-004	V. RESISTOR, Q 2 ch
	C1	NCR31CK-103AY	CAPACITOR
	C2	NCR31CK-103AY	CAPACITOR
	C3	NCR31CK-103AY	CAPACITOR
	C4	NCR31CK-103AY	CAPACITOR
	C5	NCR31CK-103AY	CAPACITOR
	C10	NEH11CM-106HZ	E. CAPACITOR
	C11	QCY81EK-104Z	CAPACITOR
	C12	NTC06CH-5R0AY	CAPACITOR
	C13	NEH11CM-106NZ	E. CAPACITOR
	C14	NEH11CM-106NZ	E. CAPACITOR
	C15	NEH11CM-106NZ	E. CAPACITOR
	C16	NEH11CM-106NZ	E. CAPACITOR
	C17	NCB31EK-103AY	CAPACITOR
	C18	NCB31EK-103AY	CAPACITOR
	C19	NEH11CM-106NZ	E. CAPACITOR
	C20	NEH11CM-106NZ	E. CAPACITOR
	C21	NCB31EK-103AY	CAPACITOR
	C22	NCB31EK-103AY	CAPACITOR
	C23	NCB31EK-103AY	CAPACITOR
	C24	YU40688-476NZ	E. CAPACITOR
	C25	QCY81EK-104Z	CAPACITOR
	C27	NCB31EK-103AY	CAPACITOR
	C28	YU40688-476NZ	E. CAPACITOR
	C29	NCB31EK-103AY	CAPACITOR
	C30	NCB31EK-103AY	CAPACITOR
	C31	NCB31EK-103AY	CAPACITOR
	C32	NCB31EK-103AY	CAPACITOR
	C33	NCB31EK-103AY	CAPACITOR
	C34	NCB31EK-103AY	CAPACITOR
	C35	–	–
	C36	QCY81EK-104Z	CAPACITOR
	C37	NCB31HK-103AY	CAPACITOR
	C38	NEH11CM-106NZ	E. CAPACITOR
	C39	YTU93026-005	E. CAPACITOR
	C40	NCB31EK-103AY	CAPACITOR
	C41	NTC06CH-5R0AY	CAPACITOR
	C42	NTC06CH-5R0AY	CAPACITOR
	C43	NTC06CH-5R0AY	CAPACITOR
	C44	NTC06CH-5R0AY	CAPACITOR
	VC1	PU56274-500	TRIMMER, of 3 ch
	VC2	PU56274-500	TRIMMER, of 1 ch
	VC3	PU56274-500	TRIMMER, of 4 ch
	VC4	PU56274-500	TRIMMER, of 2 ch
	L1	PU58201-101JZ	COIL
	L2	PU58201-101JZ	COIL
	L3	PU58201-101JZ	COIL
	L4	PU58201-101JZ	COIL
	CN2	YU41167-8	CONNECTOR
	CN3	YU40771-14	CONNECTOR
	CN4	YU40682-10	CONNECTOR

10. MIC JACK BOARD ASSEMBLY <05>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20079A1	MIC JACK BOARD ASSY
	R1	NRD187J-100N	MLF RESISTOR
	J1	PU59711	MIC JACK
	CN1	YU40096-3	CAP HOUSING
	CN2	YU40095-2	CAP HOUSING

11. JACK BOARD ASSEMBLY <06>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20079D2	JACK BOARD ASSY
	D3	RLZ8.2B	ZENER DIODE
	R1	NRD187J-221N	MLF RESISTOR
	R2	NRD187J-102N	MLF RESISTOR
	R3	NRD187J-221N	MLF RESISTOR
	R6	NRD187J-750N	MLF RESISTOR
	R9	NRD187J-102N	MLF RESISTOR
	FW1	YU40206-308	FLAT WIRE1
	FW2	YU40206-308	FLAT WIRE1
	J2	YU40273-2	JACK BOX(B)

12. TRIGGER BOARD ASSEMBLY <07>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20079B3-01	TRIGGER BOARD ASSY
	D1	ERA81-004	DIODE
	R1	QRD162J-683	RESISTOR
	S1	PU59843	TACT SWITCH
	S2	YU40969	SLIDE SWITCH
	ETH1	YQ40535	EARTH LUG
⚠	HD1	YU40832	FUSE CLIP,X2
	SPC1	YQ40478	SPACER
	WR4	QWE260-08A1A5	WIRE
	CN1	YU40096-3	CAP HOUSING
	CN2	YU40096-4	CAP HOUSING
	CN3	YU40096-2	CAP HOUSING
⚠	F1	QMF51E2-3R15	FUSE,NOT INCL.TRIG BOARD ASSY

13. SENSOR BOARD ASSEMBLY <08>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWB	YU40199-01-03	SENSOR BOARD
	SW1	YU40176	CASSETTE SWITCH
	PS1	YU40186	REEL SENSOR,X2

14. FLY CONNECTOR ASSEMBLY <09>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWB	YB30047	FLY CONN BOARD
	CN1	YU41053-03	CHIP FPC CONN.

15. OSC BOARD ASSEMBLY <10>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20142A	OSC BOARD ASSY
	Q1	2SC4081(RS)	TRANSISTOR
	Q2	2SC4081(RS)	TRANSISTOR
	Q3	2SC4081(RS)	TRANSISTOR
	Q4	2SC4081(RS)	TRANSISTOR
	Q5	2SC4081(RS)	TRANSISTOR
	R1	QRSA08J-102YN	RESISTOR
	R2	QRSA08J-153YN	RESISTOR
	R3	QRSA08K-5R6YN	RESISTOR
	R4	QRSA08K-5R6YN	RESISTOR
	R5	QRSA08J-393YN	RESISTOR
	R6	QRSA08J-393YN	RESISTOR
	R7	QRSA08K-4R7YN	RESISTOR
	R8	QRSA08K-4R7YN	RESISTOR
	R9	QRSA08J-154YN	RESISTOR
	R10	QRSA08J-154YN	RESISTOR
	C1	QCFA1EZ-473	CAPACITOR
	C2	QCF81CZ-105	CAPACITOR
	C3	QCTA1CH-101	CAPACITOR
	C4	QCTA1CH-181	CAPACITOR
	C5	QCTA1CH-271	CAPACITOR
	C6	QCTA1CH-181	CAPACITOR
	C7	QCYA1HK-103	CAPACITOR
	C8	QCYA1HK-332	CAPACITOR
	C9	QCYA1HK-332	CAPACITOR
	C10	QFZ9011-563	MM CAPACITOR
	L1	YU40248-470KY	COIL
	L2	PU58201-1R2K	COIL
⚠	L3	PU56175	S.TRANS
⚠	L4	YU41052	F.E. OSC COIL
	HD1	YQ41362	HOLDER BOARD
	SCW1	SPSH1720M	MINI SCREW
	SLD1	YQ30375	SHIELD COVER
	SLD2	YU41142	SHIELD PLATE
	CN1	YU40096-3	CAP HOUSING
	CN2	YU40096-5	CAP HOUSING
	CN3	YU40096-2	CAP HOUSING

16. VIDEO-1 BOARD ASSEMBLY <21>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20072T-C	VIDEO-1 BOARD ASSY
	IC2	UPD9319CGC	IC
		OR UPD9319BGC	IC
	IC3	UPD6147G	IC
		OR TC9229F	IC
	IC4	UPD6148GS	IC
	IC5	H8D7091B	IC
	IC6	UPC2370GH	IC

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	IC7	UPC2371GH	IC
	IC8	MSM6831MS	IC
	Q1	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q2	2SD1819(RS)	TRANSISTOR
	Q3	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q4	2SB1218(RS)	TRANSISTOR
	Q5	2SD1819(RS)	TRANSISTOR
	Q6	2SA1532(BC)	TRANSISTOR
	Q7	2SA1532(BC)	TRANSISTOR
	Q8	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q9	2SC4181	TRANSISTOR
	Q10	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q11	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q12	2SC4181	TRANSISTOR
	Q20	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q21	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q22	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q23	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q24	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q25	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q26	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q28	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q29	2SC3931(CD)	TRANSISTOR
	Q30	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q31	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q32	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q33	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q34	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q35	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q36	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	D1	MA143	DIODE
	D2	MA141WA	DIODE
	R1	NRSA63J-105N	RESISTOR
	R2	NRSA63J-102N	RESISTOR
	R3	NRSA63J-681N	RESISTOR
	R4	NRSA63J-332N	RESISTOR
	R5	NRSA63J-222N	RESISTOR
	R6	NRSA63J-182N	RESISTOR
	R7	NRSA63J-270N	RESISTOR
	R8	NRSA63J-270N	RESISTOR
	R9	NRSA63J-121N	RESISTOR
	R10	NRSA63J-512N	RESISTOR
	R11	NRSA63J-203N	RESISTOR
	R12	NRSA63J-102N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R13	NRSA63J-393N	RESISTOR
	R14	NRSA63J-102N	RESISTOR
	R15	NRSA63J-683N	RESISTOR
	R16	NVP1301-104N	V RESISTOR,BLOOMING
	R17	NRSA63J-183N	RESISTOR
	R18	NRSA63J-184N	RESISTOR
	R19	NRSA63J-183N	RESISTOR
	R20	NRSA63J-912N	RESISTOR
	R21	NRSA63J-472N	RESISTOR
	R22	NRSA63J-303N	RESISTOR
	R23	NRSA63J-303N	RESISTOR
	R24	NRSA63J-332N	RESISTOR
	R25	NRSA63J-220N	RESISTOR
	R26	NRSA63J-104N	RESISTOR
	R27	NRSA63J-332N	RESISTOR
	R28	NRSA63J-100N	RESISTOR
	R29	NRSA63J-272N	RESISTOR
	R30	NRSA63J-182N	RESISTOR
	R31	NRSA63J-332N	RESISTOR
	R32	NRSA63J-222N	RESISTOR
	R33	NRSA63J-221N	RESISTOR
	R34	NRSA63J-331N	RESISTOR
	R35	NRSA63J-221N	RESISTOR
	R36	NRSA63J-681N	RESISTOR
	R37	NRSA63J-681N	RESISTOR
	R38	NRSA63J-560N	RESISTOR
	R39	NRSA63J-680N	RESISTOR
	R40	NRSA63J-681N	RESISTOR
	R41	NRSA63J-102N	RESISTOR
	R42	NRSA63J-182N	RESISTOR
	R43	NRSA63J-100N	RESISTOR
	R44	NRSA63J-272N	RESISTOR
	R46	NRSA63J-0R0A	RESISTOR
	R47	NRSA63J-0R0A	RESISTOR
	R50	NRSA63J-102N	RESISTOR
	R51	NRSA63J-102N	RESISTOR
	R52	NRSA63J-102N	RESISTOR
	R53	NRSA63J-332N	RESISTOR
	R54	NVP1301-223N	V RESISTOR,AGC
	R55	NRSA63J-473N	RESISTOR
	R56	NRSA63J-103N	RESISTOR
	R57	NRSA63J-303N	RESISTOR
	R58	NRSA63J-123N	RESISTOR
	R59	NRSA63J-473N	RESISTOR
	R60	NRSA63J-563N	RESISTOR
	R61	NRSA63J-102N	RESISTOR
	R62	NVP1301-103N	V RESISTOR, **BLUE SEP**
	R63	NVP1301-103N	V RESISTOR, **RED SEP**
	R64	NRSA63J-102N	RESISTOR
	R65	NVP1301-103N	V RESISTOR,R GAIN
	R66	NVP1301-103N	V RESISTOR,B GAIN
	R67	NRSA63J-332N	RESISTOR
	R68	NRSA63J-562N	RESISTOR
	R69	NRSA63J-102N	RESISTOR
	R70	NRSA63G-103N	RESISTOR
	R71	NRSA63G-103N	RESISTOR
	R72	NRSA63J-682N	RESISTOR
	R73	NRSA63J-103N	RESISTOR
	R74	NRSA63J-102N	RESISTOR
	R75	NVP1301-103N	V RESISTOR,R SET UP
	R76	NVP1301-103N	V RESISTOR,B SET UP
	R77	NRSA63J-102N	RESISTOR
	R78	NRSA63G-273N	RESISTOR
	R79	NRSA63G-393N	RESISTOR
	R80	NRSA63J-183N	RESISTOR
	R81	NRSA63J-243N	RESISTOR
	R82	NRSA63J-821N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R83	NRSA63J-122N	RESISTOR
	R84	NRSA63J-332N	RESISTOR
	R85	NRSA63J-102N	RESISTOR
	R86	NRSA63J-102N	RESISTOR
	R87	NRSA63J-102N	RESISTOR
	R88	NRSA63J-102N	RESISTOR
	R89	NRSA63J-562N	RESISTOR
	R90	NRSA63J-0R0A	RESISTOR
	R94	NRSA63J-102N	RESISTOR
	R95	NRSA63J-102N	RESISTOR
	R96	NRSA63J-102N	RESISTOR
	R97	NRSA63J-562N	RESISTOR
	R98	NRSA63J-222N	RESISTOR
	R99	NRSA63J-124N	RESISTOR
	R100	NRSA63J-681N	RESISTOR
	R101	NRSA63J-102N	RESISTOR
	R102	NRSA63J-102N	RESISTOR
	R103	NRSA63J-182N	RESISTOR
	R104	NRSA63J-391N	RESISTOR
	R105	NRSA63J-102N	RESISTOR
	R106	NRSA63J-271N	RESISTOR
	R107	NRSA63J-751N	RESISTOR
	R108	NRSA63J-222N	RESISTOR
	R109	NRSA63J-122N	RESISTOR
	R110	NRSA63J-472N	RESISTOR
	R111	NRSA63J-102N	RESISTOR
	R112	NRSA63J-102N	RESISTOR
	R113	NVP1301-222N	V RESISTOR, 1H DELAYED SIG LEV
	R114	NRSA63J-153N	RESISTOR
	R120	NRSA63J-222N	RESISTOR
	R121	NRSA63J-332N	RESISTOR
	R122	NRSA63J-822N	RESISTOR
	R123	NRSA63J-222N	RESISTOR
	R124	NRSA63J-102N	RESISTOR
	R125	NVP1301-103N	V RESISTOR,B-Y LEVEL
	R126	NRSA63J-821N	RESISTOR
	R127	NRSA63J-122N	RESISTOR
	R128	NRSA63J-105N	RESISTOR
	R130	NRSA63J-333N	RESISTOR
	R131	NRSA63J-104N	RESISTOR
	R132	NRSA63J-183N	RESISTOR
	R133	NRSA63J-333N	RESISTOR
	R134	NRSA63J-102N	RESISTOR
	R135	NVP1301-103N	V RESISTOR,YH Y LEVEL
	R136	NRSA63J-102N	RESISTOR
	R137	NRSA63J-102N	RESISTOR
	R138	NRSA63J-102N	RESISTOR
	R139	NRSA63J-102N	RESISTOR
	R140	NRSA63J-102N	RESISTOR
	R141	NRSA63J-333N	RESISTOR
	R142	NRSA63J-333N	RESISTOR
	R143	NRSA63J-333N	RESISTOR
	R144	NRSA63J-333N	RESISTOR
	R145	NRSA63J-102N	RESISTOR
	R146	NRSA63J-103N	RESISTOR
	R147	NRSA63J-103N	RESISTOR
	R148	NRSA63J-123N	RESISTOR
	R149	NVP1301-223N	V RESISTOR, CHROMA D. OFFSET
	R151	NRSA63J-333N	RESISTOR
	R152	NRSA63J-154N	RESISTOR
	R154	NVP1301-103N	V RESISTOR,CD BALANCE
	R155	NRSA63J-102N	RESISTOR
	R156	NRSA63J-393N	RESISTOR
	R157	NRSA63J-183N	RESISTOR
	R160	NRSA63J-822N	RESISTOR
	C2	NCT07CH-100A	CAPACITOR
	C3	PU59867-100W	CHIP TRIM. OSC FREQ

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C8	NCB31EK-103A	CAPACITOR
	C9	NEH10JM-107NP	E CAPACITOR
	OR	NEH30JM-107NP	CAPACITOR
	C10	NCB31EK-103A	CAPACITOR
	C11	NEH10JM-226NZ	E CAPACITOR
	OR	NEH30JM-226NZ	CAPACITOR
	C12	NCB31EK-103A	CAPACITOR
	C13	NEH11CM-106NZ	E CAPACITOR
	OR	NEH31CM-106NZ	E CAPACITOR
	C14	NCB31EK-103A	CAPACITOR
	C15	NCB31EK-103A	CAPACITOR
	C16	NEH11CM-476NP	E CAPACITOR
	OR	NEH31CM-476NP	CAPACITOR
	C17	NCB31EK-103A	CAPACITOR
	C18	NCB31EK-103A	CAPACITOR
	C19	NEH10JM-107NP	E CAPACITOR
	OR	NEH30JM-107NP	CAPACITOR
	C20	NEH11CM-476NP	E CAPACITOR
	OR	NEH31CM-476NP	CAPACITOR
	C21	NCB31EK-103A	CAPACITOR
	C22	NEH10JM-226NZ	E CAPACITOR
	OR	NEH30JM-226NZ	CAPACITOR
	C23	NCB31EK-103A	CAPACITOR
	C24	NCB31EK-103A	CAPACITOR
	C25	NEH11EM-475NZ	E CAPACITOR
	OR	NEH31EM-475NZ	E CAPACITOR
	C26	NCB31EK-103A	CAPACITOR
	C27	NCB31EK-103A	CAPACITOR
	C28	NCB31EK-103A	CAPACITOR
	C29	NCB31EK-103A	CAPACITOR
	C30	NCB31EK-103A	CAPACITOR
	C31	NCB31EK-103A	CAPACITOR
	C32	NEH11CM-106NZ	E CAPACITOR
	OR	NEH31CM-106NZ	E CAPACITOR
	C33	NCB31EK-103A	CAPACITOR
	C34	QEF81AM-106	TANTAL CAPACITOR
	C35	NEH10JM-226NZ	E CAPACITOR
	OR	NEH30JM-226NZ	CAPACITOR
	C36	NCB31EK-103A	CAPACITOR
	C37	NCT07CH-221A	CAPACITOR
	C38	QEF80GM-106	TANTAL CAPACITOR
	C39	NCT07CH-330A	CAPACITOR
	C40	NCT07CH-470A	CAPACITOR
	C41	NCT07CH-470A	CAPACITOR
	C42	QCY81HK-473	CAPACITOR
	OR	NCB11HK-473P	CAPACITOR
	C43	NEH11EM-475NZ	E CAPACITOR
	OR	NEH31EM-475NZ	E CAPACITOR
	C45	NCB31EK-103A	CAPACITOR
	C46	NCB31EK-103A	CAPACITOR
	C47	NCB31EK-103A	CAPACITOR
	C48	NCB31EK-103A	CAPACITOR
	C49	PU59913-473	CAPACITOR
	C50	NEH10JM-226NZ	E CAPACITOR
	OR	NEH30JM-226NZ	CAPACITOR
	C51	NCB31EK-103A	CAPACITOR
	C52	YU40265-1	E CAPACITOR
	OR	QEZ0149-567	E CAPACITOR
	C53	NCB31EK-103A	CAPACITOR
	C54	NEH11CM-106NZ	E CAPACITOR
	OR	NEH31CM-106NZ	E CAPACITOR
	C55	NEH10JM-226NZ	E CAPACITOR
	OR	NEH30JM-226NZ	CAPACITOR
	C56	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C57	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C58	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C59	QCFA1EZ-104	CAPACITOR
	C60	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C61	QCFA1EZ-104	CAPACITOR
	C62	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C63	QCFA1EZ-104	CAPACITOR
	C64	PU59913-473	CAPACITOR
	C65	PU59913-473	CAPACITOR
	C66	QCFA1EZ-104	CAPACITOR
	C67	QCFA1EZ-104	CAPACITOR
	C68	QCFA1EZ-104	CAPACITOR
	C69	QCFA1EZ-104	CAPACITOR
	C70	QCFA1EZ-104	CAPACITOR
	C71	QCFA1EZ-104	CAPACITOR
	C72	NCB31EK-103A	CAPACITOR
	C73	NEH10JM-107NP	E CAPACITOR
	OR	NEH30JM-107NP	CAPACITOR
	C74	NCF31CZ-104A	CAPACITOR
	C79	NCF31CZ-104A	CAPACITOR
	C80	QEF81AM-106	TANTAL CAPACITOR
	C81	QEF81CM-475	TANTAL CAPACITOR
	C82	QEF81VM-334	TANTAL CAPACITOR
	C83	QEF81VM-334	TANTAL CAPACITOR
	C84	NCB31EK-103A	CAPACITOR
	C85	NCB31EK-103A	CAPACITOR
	C86	QEF81AM-475	TANTAL CAPACITOR
	C87	NCB31EK-103A	CAPACITOR
	C88	NCB31EK-103A	CAPACITOR
	C89	QEF81AM-475	TANTAL CAPACITOR
	C90	QEF81AM-475	TANTAL CAPACITOR
	C91	NCF31CZ-104A	CAPACITOR
	C92	NCF31CZ-104A	CAPACITOR
	C100	NEH10JM-226NZ	E CAPACITOR
	OR	NEH30JM-226NZ	CAPACITOR
	C101	NCB31EK-103A	CAPACITOR
	C102	PU59913-473	CAPACITOR
	C103	NCF31CZ-104A	CAPACITOR
	C104	PU59913-473	CAPACITOR
	C105	NCT07CH-220A	CAPACITOR
	C106	NCB31EK-103A	CAPACITOR
	C107	QEF81AM-106	TANTAL CAPACITOR
	C108	NCB31EK-103A	CAPACITOR
	C109	PU59913-473	CAPACITOR
	C110	PU59913-473	CAPACITOR
	C111	PU59913-473	CAPACITOR
	C112	PU59913-473	CAPACITOR
	C113	PU59913-473	CAPACITOR
	C114	PU59913-473	CAPACITOR
	C115	NCB31EK-103A	CAPACITOR
	C116	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C119	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	L101	YU40248-220KY	COIL
	L102	YU40248-220KY	COIL
	L103	YU40248-220KY	COIL
	L104	YU40248-220KY	COIL
	L105	YU40248-220KY	COIL
	L106	YU40248-220KY	COIL
	L107	YU40248-220KY	COIL
	L108	YU40248-220KY	COIL
	L109	YU40248-220KY	COIL
	L110	YU40248-220KY	COIL
	L111	YU40248-470KY	COIL
	L112	YU40248-220KY	COIL
	L113	YU40248-470KY	COIL
	EQ102	YU40324	EQUALIZER
	EQ103	YU40324	EQUALIZER

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	LPF103	YU40390-3	LOW PASS FILTER
	LPF104	YU40444	LOW PASS FILTER
	OR	YU40600-P	LOW PASS FILTER
	LPF105	YU40443	LOW PASS FILTER
	LPF106	YU40444	LOW PASS FILTER
	OR	YU40600-P	LOW PASS FILTER
	DL101	YU40128-2	DELAY LINE
⚠	X101	YU40389	CRYSTAL RESONATOR
	TRAP101	YU40639	CHIP TRAP
	OR	YU40639-Z	CHIP TRAP
	SLD1	YU40554-1-1	INSULATER
	SLD1 OR	YU40554	INSULATER
	TP101	YU40581-AY	CHIP TP(2125)
	TP102	YU40581-AY	CHIP TP(2125)
	TP103	YU40581-AY	CHIP TP(2125)
	TP104	YU40581-AY	CHIP TP(2125)
	TP105	YU40581-AY	CHIP TP(2125)
	TP106	YU40581-AY	CHIP TP(2125)
	TP107	YU40581-AY	CHIP TP(2125)
	CN101	PU58655-3	CAP HOUSING
	CN102	PU58654-10	CAP HOUSING
	CN103	YU40101-10	CAP HOUSING
	CN104	YU40101-8	CAP HOUSING
	CN105	YU40103-8	CAP HOUSING
	CN106	YU40101-10	CAP HOUSING
	CN107	YU40101-8	CAP HOUSING
⚠	CP101	ICP-F20	CIRCUIT PROTECTOR
⚠	CP102	ICP-F10	CIRCUIT PROTECTOR

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17. VIDEO-2 BOARD ASSEMBLY <22>

	PWBA	YB20073B-03-C	VIDEO-2 BOARD ASSY
	IC201	MSM6985MS	IC
	IC202	MSM6985MS	IC
	Q201	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	Q202	2SA1532(BC)	TRANSISTOR
	OR	2SA1576(QR)	TRANSISTOR
	Q203	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	Q204	2SA1532(BC)	TRANSISTOR
	OR	2SA1576(QR)	TRANSISTOR
	R201	QRSA08J-0R0Y	RESISTOR
	R203	QRSA08J-152YN	RESISTOR
	R204	QRSA08J-102YN	RESISTOR
	R205	QRSA08J-102YN	RESISTOR
	R206	QRSA08J-222YN	RESISTOR
	R207	QRSA08J-472YN	RESISTOR
	R208	QRSA08J-682YN	RESISTOR
	R209	QRSA08J-152YN	RESISTOR
	R210	QRSA08J-102YN	RESISTOR
	R211	QRSA08J-102YN	RESISTOR
	R212	QRSA08J-222YN	RESISTOR
	C201	QEF81CM-685	TANTAL CAPACITOR

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C202	QEF81AM-475	TANTAL CAPACITOR
	C203	QCYA1HJ-103	CAPACITOR
	C204	QCYA1HJ-103	CAPACITOR
	C205	QCYA1HJ-103	CAPACITOR
	C206	QCYA1HJ-103	CAPACITOR
	C207	QCFA1EZ-104	CAPACITOR
	C208	QEF81AM-475	TANTAL CAPACITOR
	C209	QCYA1HJ-103	CAPACITOR
	C210	QCYA1HJ-103	CAPACITOR
	C211	QCYA1HJ-103	CAPACITOR
	C212	QCYA1HJ-103	CAPACITOR
	C213	QCFA1EZ-104	CAPACITOR
	C214	QEF81AM-475	TANTAL CAPACITOR
	L201	YU40248-220KY	COIL
	L202	YU40248-220KY	COIL
	LPF201	YU40392	LOW PASS FILTER
	LPF202	YU40392	LOW PASS FILTER
	CN201	YU40105-8	CAP HOUSING

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* 18. ENCODER BORAD ASSEMBLY <23> *

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*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20128A-02-C	ENC BOARD ASSY
	IC301	AN2276S	IC
	IC302	BA7606F	IC
	IC303	MC8181D	IC
	IC304	TC4S71F	IC
	IC305	NJM4560M	IC
		OR RC4560M	IC
		OR BA4560F	IC
	IC306	NJM4560M	IC
		OR BA4560F	IC
		OR RC4560M	IC
	IC307	H8D7051A	IC
	IC308	TC4S69F	IC
	IC309	TC4S81F	IC
	IC310	TC4S81F	IC
	Q301	2SC3936(BC)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q302	2SC3936(C)	TRANSISTOR
		OR 2SC4177(6)	TRANSISTOR
		OR 2SC4098(Q)	TRANSISTOR
	Q303	2SC3936(C)	TRANSISTOR
		OR 2SC4098(Q)	TRANSISTOR
		OR 2SC4177(6)	TRANSISTOR
	Q304	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q305	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
	Q306	2SC3936(BC)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q307	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
	Q308	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
	Q309	2SC3936(BC)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q310	2SC3936(BC)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q311	2SC3931(BC)	TRANSISTOR
		OR 2SC4099(NP)	TRANSISTOR
		OR 2SC4178(34)	TRANSISTOR
	D301	RD7.5M-T1B2	ZENER DIODE
	D302	MA141WA	DIODE
	D303	MA141WK	DIODE
	R301	NRSA63J-103N	RESISTOR
	R302	NRSA63J-102N	RESISTOR
	R303	NRSA63J-103N	RESISTOR
	R304	NRSA63J-152N	RESISTOR
	R305	NRSA63J-222N	RESISTOR
	R306	NRSA63J-471N	RESISTOR
	R307	NRSA63J-123N	RESISTOR
	R308	NRSA63J-392N	RESISTOR
	R309	NRSA63J-123N	RESISTOR
	R310	NRSA63J-103N	RESISTOR
	R311	NRSA63G-224N	RESISTOR
	R312	NRSA63G-223N	RESISTOR
	R313	NRSA63G-473N	RESISTOR
	R314	NRSA63J-122N	RESISTOR
	R315	NRSA63J-682N	RESISTOR
	R316	NRSA63G-223N	RESISTOR
	R317	NRSA63G-683N	RESISTOR
	R318	NRSA63J-123N	RESISTOR
	R319	NRSA63J-103N	RESISTOR
	R320	NRSA63J-103N	RESISTOR
	R321	NRSA63J-562N	RESISTOR
	R322	NRSA63G-223N	RESISTOR
	R323	NRSA63J-123N	RESISTOR
	R324	NRSA63J-562N	RESISTOR
	R325	NRSA63G-224N	RESISTOR
	R326	NRSA63J-222N	RESISTOR
	R327	NVP1301-223N	V RESISTOR, WHITE CLIP LEVEL
	R328	NRSA63J-222N	RESISTOR
	R329	NRSA63J-102N	RESISTOR
	R330	NVP1301-103N	V RESISTOR, SYNC LEVEL
	R331	NRSA63J-123N	RESISTOR
	R332	NRSA63J-822N	RESISTOR
	R333	NRSA63J-271N	RESISTOR
	R334	NRSA63J-103N	RESISTOR
	R335	NRSA63J-682N	RESISTOR
	R336	NRSA63J-103N	RESISTOR
	R337	NRSA63J-102N	RESISTOR
	R338	NRSA63J-152N	RESISTOR
	R339	NRSA63J-103N	RESISTOR
	R340	NRSA63J-100N	RESISTOR
	R341	NRSA63J-223N	RESISTOR
	R342	NRSA63J-223N	RESISTOR
	R343	NRSA63J-223N	RESISTOR
	R344	NVP1301-223N	V RESISTOR, R ENCODER BALANCE
	R345	NVP1301-223N	V RESISTOR, B ENCODER BALANCE
	R346	NRSA63J-102N	RESISTOR
	R347	NVP1301-473N	V RESISTOR, SUB CARR PHASE
	R348	NRSA63J-102N	RESISTOR
	R349	NRSA63J-102N	RESISTOR
	R350	NRSA63J-100N	RESISTOR
	R351	NRSA63J-102N	RESISTOR
	R352	NRSA63J-223N	RESISTOR
	R353	NVP1301-103N	V RESISTOR, BURST LEVEL
	R354	NRSA63J-223N	RESISTOR
	R355	NRSA63J-102N	RESISTOR
	R356	NVP1301-103N	V RESISTOR, CHROMA GAIN

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R357	NRSA63J-102N	RESISTOR
	R358	NRSA63J-272N	RESISTOR
	R359	NRSA63J-102N	RESISTOR
	R360	NRSA63J-821N	RESISTOR
	R361	NRSA63J-681N	RESISTOR
	R362	NRSA63J-821N	RESISTOR
	R363	NRSA63J-681N	RESISTOR
	R364	NVP1301-222N	V RESISTOR,BURST PHASE
	R365	NRSA63J-562N	RESISTOR
	R370	NRSA63J-394N	RESISTOR
	R374	NRSA63J-103N	RESISTOR
	R375	NVP1301-223N	V RESISTOR,B LINE SW CARR
	R376	NVP1301-223N	V RESISTOR,R LINE SW CARR
	R377	NRSA63J-102N	RESISTOR
	R378	NRSA63J-102N	RESISTOR
	R379	NRSA63J-223N	RESISTOR
	R380	NRSA63J-103N	RESISTOR
	R381	NRSA63J-103N	RESISTOR
	R383	NRSA63J-272N	RESISTOR
	R384	NRSA63J-272N	RESISTOR
	R385	NVP1301-103N	V RESISTOR,RED PHASE
	R388	NRSA63J-681N	RESISTOR
	R390	NRSA63J-331N	RESISTOR
	R391	NRSA63J-822N	RESISTOR
	R392	NRSA63J-102N	RESISTOR
	R393	NRSA63J-473N	RESISTOR
	C301	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C302	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C303	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C304	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C305	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C306	NCR21CM-473A	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C307	NEH11CM-106NZ	E CAPACITOR
	C308	NEH11CM-106NZ	E CAPACITOR
	C309	QEF81EM-155	TANTAL CAPACITOR
	C310	NCR21CM-473A	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C311	NCR21CM-473A	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C312	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C313	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C314	NCB31EK-103A	CAPACITOR
	C315	NCB31EK-103A	CAPACITOR
	C316	NCB31EK-103A	CAPACITOR
	C317	NCB31EK-103A	CAPACITOR
	C318	QEF80GM-226	TANTAL CAPACITOR
	C319	NCT07CH-470A	CAPACITOR
	C320	NCT07CH-560A	CAPACITOR
	C321	NCT07CH-560A	CAPACITOR
	C322	NCB31EK-103A	CAPACITOR
	C323	NCB31EK-103A	CAPACITOR
	C324	NCB31EK-103A	CAPACITOR
	C325	QED40JM-127	E CAPACITOR
	C326	NCB31EK-103A	CAPACITOR
	C327	NCB31EK-103A	CAPACITOR
	C328	QEJ41CM-476	TANTAL CAPACITOR
	C329	NCB31EK-103A	CAPACITOR
	C330	NEH10JM-226NZ	E CAPACITOR
	C331	NEH10JM-226NZ	E CAPACITOR
	C332	NCB31EK-103A	CAPACITOR
	C333	NEH10JM-226NZ	E CAPACITOR
	C334	NCB31EK-103A	CAPACITOR
	C335	NCS31HJ-331A	CAPACITOR
	C336	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C337	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C339	NCT07CH-101A	CAPACITOR
	C340	NCT07CH-101A	CAPACITOR
	C341	NCF31CZ-104A	CAPACITOR
	C342	NCF31CZ-104A	CAPACITOR
	C343	NCB31EK-103A	CAPACITOR
	C347	NCB31EK-103A	CAPACITOR
	L301	YU40248-220KY	COIL
	L302	YU40248-220KY	COIL
	L303	YU40910	FERRITE BEAD
	L304	YU40248-101KY	COIL
	EQ301	YU40637	EQUALIZER
	OR	YU40720	EQUALIZER
	BPF301	YU40393-2	BAND PASS FILTER
	OR	YU40599-P	BAND PASS FILTER
	TRAP301	YU40487	443TRAP
	TP303	YU40648	TEST PIN
	TP305	YU40648	TEST PIN
	CN301	YU40105-10	CAP HOUSING
	CN302	YU40096-8	CAP HOUSING
	CN303	YU40096-2Y	CAP HOUSING
	CN304	YU40096-4Y	CAP HOUSING
	CN305	YU40105-8	CAP HOUSING

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* 19. INDICATOR-1 BOARD ASSEMBLY <24> *

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REF NO.	PART NO.	PART NAME, DESCRIPTION
PWBA	YB20075F-01-C	IND-1 BOARD ASSY
IC401	VC2091	IC
IC402	VC2041	IC
IC404	UPC324G2	IC
IC405	6VT08	IC
Q403	2SC3936(BC)	TRANSISTOR
Q404	2SC3936(BC)	TRANSISTOR
Q405	2SC3936(BC)	TRANSISTOR
Q406	2SC3936(BC)	TRANSISTOR
Q407	2SA1532(BC)	TRANSISTOR
Q408	2SA1532(BC)	TRANSISTOR

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	Q409	2SK198P,Q	FE TRANSISTOR
	Q410	2SC3936(BC)	TRANSISTOR
	Q411	2SA1532(BC)	TRANSISTOR
	Q412	2SA1532(BC)	TRANSISTOR
	Q413	2SA1532(BC)	TRANSISTOR
	D401	RD8.2MB2	ZENER DIODE
	D402	MA704	DIODE
	D403	MA141WK	DIODE
⚠	D404	MA704	DIODE
	D405	MA141WA	DIODE
	R401	NRSA63J-122N	RESISTOR
	R402	NVP1301-472N	V RESISTOR,IND OSC
	R404	NRSA63J-0R0A	RESISTOR
	R405	NRSA63J-0R0A	RESISTOR
	R407	NRSA63J-0R0A	RESISTOR
	R409	NRSA63J-223N	RESISTOR
⚠	R413	NRSA63J-222N	RESISTOR
	R420	NRSA63J-222N	RESISTOR
	R421	NRSA63J-222N	RESISTOR
	R422	NRSA63J-393N	RESISTOR
	R423	NRSA63J-682N	RESISTOR
	R424	NRSA63J-333N	RESISTOR
	R425	NRSA63J-103N	RESISTOR
	R426	NRSA63J-152N	RESISTOR
	R427	NRSA63J-222N	RESISTOR
	R428	NRSA63J-152N	RESISTOR
	R429	NRSA63J-472N	RESISTOR
	R430	NRSA63J-101N	RESISTOR
	R431	NRSA63J-472N	RESISTOR
	R432	NRSA63J-333N	RESISTOR
	R433	NRSA63J-223N	RESISTOR
	R434	NRSA63J-101N	RESISTOR
	R435	NRSA63J-333N	RESISTOR
	R436	NRSA63J-223N	RESISTOR
	R437	NRSA63J-473N	RESISTOR
	R438	NRSA63J-473N	RESISTOR
	R439	NRSA63J-122N	RESISTOR
	R440	NRSA63J-683N	RESISTOR
	R441	NRSA63J-682N	RESISTOR
	R442	NRSA63J-153N	RESISTOR
	R443	NRSA63J-222N	RESISTOR
	R445	NRSA63J-272N	RESISTOR
	R446	NVP1301-102N	V RESISTOR, IRIS
	R447	NRSA63J-222N	RESISTOR
	R448	NRSA63J-560N	RESISTOR
	R449	NRSA63J-273N	RESISTOR
	R450	NRSA63J-223N	RESISTOR
	R451	NRSA63J-473N	RESISTOR
	R452	NRSA63J-123N	RESISTOR
	R453	NRSA63J-123N	RESISTOR
	R454	NRSA63J-103N	RESISTOR
	R455	NRSA63J-103N	RESISTOR
	R457	NRSA63J-0R0A	RESISTOR
	R458	NRSA63J-102N	RESISTOR
	R459	NRSA63J-103N	RESISTOR
	R460	NRSA63J-103N	RESISTOR
	R462	NRSA63J-0R0A	RESISTOR
	R463	NRSA63J-333N	RESISTOR
	R464	NRSA63J-682N	RESISTOR
	R465	NRSA63J-104N	RESISTOR
	R466	NRSA63J-104N	RESISTOR
	R467	NRSA63J-104N	RESISTOR
	R468	NRSA63J-104N	RESISTOR
	R469	NRSA63J-103N	RESISTOR
	R470	NRSA63J-102N	RESISTOR

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R471	NRSA63J-104N	RESISTOR
	R472	NRSA63J-0R0A	RESISTOR
	R474	NRSA63J-222N	RESISTOR
	R475	NRSA63J-222N	RESISTOR
	R476	NRSA63J-102N	RESISTOR
	R478	NRSA63J-104N	RESISTOR
	R479	NRSA63J-104N	RESISTOR
	R480	NRSA63J-104N	RESISTOR
	C402	NCF31CZ-104A	CAPACITOR
	C403	QEF81CM-226	TANTAL CAPACITOR
	C404	NCF31CZ-104A	CAPACITOR
	C405	NCT07CH-180A	CAPACITOR
	C406	NCT07CH-220A	CAPACITOR
	C407	NCT07CH-220A	CAPACITOR
	C408-2	QEF80JM-476	TANTAL CAPACITOR
	C409	ECEV0JV220R	E CAPACITOR
		OR NEH30JM-226NZ	CAPACITOR
	C410	QCFA1EZ-104	CAPACITOR
	C413	PU59758-105	CAPACITOR
		OR QCF81CZ-105	CAPACITOR
	C414	ECEV1CV100R	E CAPACITOR
		OR NEH31CM-106NZ	E CAPACITOR
	C415	ECEV0JV220R	E CAPACITOR
		OR NEH30JM-226NZ	CAPACITOR
	C416	NCT07CH-101A	CAPACITOR
	C417	NCF31CZ-104A	CAPACITOR
	C418	QEF80GM-226	TANTAL CAPACITOR
		OR QEF80JM-226	TANTAL CAPACITOR
	C419	QEF80JM-106	TANTAL CAPACITOR
	C420	QEF80JM-475	TANTAL CAPACITOR
	C421	QEF81EM-474	TANTAL CAPACITOR
	C422	ECEV1CV100R	E CAPACITOR
		OR NEH31CM-106NZ	E CAPACITOR
	C423	NCB31EK-103A	CAPACITOR
	C425	NCS31HK-221A	CAPACITOR
	C426	NCF31CZ-104A	CAPACITOR
	C427	NCF31CZ-104A	CAPACITOR
	C428	NCF31CZ-104A	CAPACITOR
	C429	NCF31CZ-104A	CAPACITOR
	C431	NCF31CZ-104A	CAPACITOR
	C432	NCF31CZ-104A	CAPACITOR
	C433	NCF31CZ-104A	CAPACITOR
	C434	NCB31EK-103A	CAPACITOR
	C435	NCB31EK-103A	CAPACITOR
	C437	NCB31EK-103A	CAPACITOR
	L401	YU40248-220KY	COIL
	L402	PU58201-120K	COIL
	L405	PU58201-120K	COIL
	L406	PU58201-120K	COIL
⚠	X401	YU40141	CRYSTAL RESONATOR
	CN401	YU40179-110	CAP HOUSING
	CN402	YU40108-10	CAP HOUSING
	CN403	YU40105-10	CAP HOUSING,(BOARD TO BOARD)
	CN404	YU40105-22	CAP HOUSING,(BOARD TO BOARD)
	CN405	YU40096-7	CAP HOUSING
	CN408	YU40096-10	CAP HOUSING
	CN409	YU40096-2R	CAP HOUSING
	CN410	YU40096-2R	CAP HOUSING
	CN411	YU40105-8	CAP HOUSING,(BOARD TO BOARD)
	CN412	YU40096-3Y	CAP HOUSING
	CN413	YU40096-3	CAP HOUSING

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20. FULL AUTO WHITE BOARD ASSEMBLY <25>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20076A-03-C	FAW BOARD ASSY
	IC501	VC2038	IC
	IC502	BA10324F	IC
	OR	UPC324G2	IC
	OR	XRA10324F	IC
	IC503	BA10324F	IC
	OR	UPC324G2	IC
	OR	XRA10324F	IC
	PD501	PD170V1	PHOTO DIODE
	R501	NRSA63J-154N	RESISTOR
	R502	NRSA63J-123N	RESISTOR
	R503	NVP1301-223N	V RESISTOR, AW INDOOR B
	R504	NRSA63J-563N	RESISTOR
	R505	NRSA63J-183N	RESISTOR
	R506	NVP1301-223N	V RESISTOR, AW INDOOR R
	R507	NRSA63J-563N	RESISTOR
	R508	NRSA63J-223N	RESISTOR
	R509	NRSA63J-683N	RESISTOR
	R511	NRSA63J-473N	RESISTOR
	R512	NRSA63J-473N	RESISTOR
	R513	NRSA63J-823N	RESISTOR
	R514	NRSA63J-0R0A	RESISTOR
	R515	NVP1301-473N	V RESISTOR, AW INDOOR R LIM
	R516	NRSA63J-473N	RESISTOR
	R518	NRSA63J-0R0A	RESISTOR
	R519	NVP1301-473N	V RESISTOR, AW OUTDOOR R LIM
	R520	NRSA63J-473N	RESISTOR
	R522	QRSA08F-223YN	RESISTOR
	R523	QRSA08F-153YN	RESISTOR
	R524	QRSA08F-513YN	RESISTOR
	R525	NRSA63J-0R0A	RESISTOR
	R526	QRSA08J-0R0Y	RESISTOR
	R527	NVP1301-473N	V RESISTOR, PRESET B OUTDOOR
	R528	QRSA08J-473YN	RESISTOR
	R530	NRSA63J-0R0A	RESISTOR
	R531	NVP1301-473N	V RESISTOR, AW OUTDOOR B LIM
	R532	NRSA63J-473N	RESISTOR
	R534	NRSA63J-0R0A	RESISTOR
	R535	NVP1301-473N	V RESISTOR, AW INDOOR B LIM
	R536	NRSA63J-473N	RESISTOR
	R538	QRSA08F-223YN	RESISTOR
	R539	NVP1301-473N	V RESISTOR, PRESET FL R
	R540	QRSA08F-433YN	RESISTOR
	R541	NRSA63J-0R0A	RESISTOR
	R542	QRSA08F-223YN	RESISTOR
	R544	QRSA08F-473YN	RESISTOR
	R546	QRSA08J-0R0Y	RESISTOR
	R547	NVP1301-473N	V RESISTOR, PRESET R OUTDOOR
	R548	QRSA08J-473YN	RESISTOR
	R550	QRSA08F-183YN	RESISTOR
	R552	QRSA08F-563YN	RESISTOR
	R554	NRSA63J-102N	RESISTOR
	R555	NRSA63J-182N	RESISTOR
	R556	NRSA63J-102N	RESISTOR
	R557	NRSA63J-122N	RESISTOR
	R558	NRSA63J-104N	RESISTOR
	R559	NVP1301-224N	V RESISTOR, AW OUTDOOR B
	R560	NRSA63J-102N	RESISTOR
	R561	NRSA63J-153N	RESISTOR
	R562	NRSA63J-153N	RESISTOR
	R563	NVP1301-224N	V RESISTOR, AW OUTDOOR R
	R564	NRSA63J-102N	RESISTOR
	R565	NRSA63J-104N	RESISTOR
	R566	NRSA63J-103N	RESISTOR
	R567	NRSA63J-103N	RESISTOR
	R572	NRSA63J-472N	RESISTOR
	R573	NRSA63J-0R0A	RESISTOR
	R574	NRSA63J-222N	RESISTOR
	R575	NRSA63J-0R0A	RESISTOR
	R576	NRSA63J-0R0A	RESISTOR
	R581	NRSA63J-101N	RESISTOR
	R582	NRSA63J-101N	RESISTOR
	C502	NCB31EK-103A	CAPACITOR
	C503	NEH11CM-106NZ	E CAPACITOR
	C504	NCB31HK-272A	CAPACITOR
	C505	NCB31HK-272A	CAPACITOR
	C506	NCB31HK-272A	CAPACITOR
	C507	NEH11CM-106NZ	E CAPACITOR
	C508	NCB31EK-103A	CAPACITOR
	C509	NEH10JM-226NZ	E CAPACITOR
	C510	NEH11EM-475NZ	E CAPACITOR
	C511	NEH11EM-475NZ	E CAPACITOR
	C516	NCB31EK-103A	CAPACITOR
	L501	PU58201-220K	COIL
	OR	YU40248-220KY	COIL
	SW501	PU57008	TACT SWITCH
	SW502	PU57008	TACT SWITCH
	FIL1	YQ40394	WHITE FILTER
	SLD1	YQ40395	SHIELD CASE
	SLD2	YQ40396	SHIELD PLATE
	CN501	YU40101-22	CAP HOUSING, (BOARD TO BOARD)
	CN502	YU40101-12	CAP HOUSING, (BOARD TO BOARD)
	CN503	YU40095-4	CAP HOUSING

21. MIC AMP BOARD ASSEMBLY <26>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB30030A-01-C	MIC AMP BOARD ASSY
	IC701	M5282FP	IC
	R701	NRSA63J-102N	RESISTOR
	R702	NRSA63J-562N	RESISTOR
	R703	NRSA63J-102N	RESISTOR
	R704	NRSA63J-473N	RESISTOR
	R705	NRSA63J-221N	RESISTOR
	R706	NRSA63J-223N	RESISTOR
	R708	NRSA63J-682N	RESISTOR
	R709	NRSA63J-103N	RESISTOR
	R711	NRSA63J-222N	RESISTOR
	R712	NRSA63J-0R0A	RESISTOR
	C701	ECEV1EV4R7R	E CAPACITOR
	OR	NEH31EM-475NZ	E CAPACITOR
	C702	ECEV1CV470P	E CAPACITOR
	C703	NEH10GM-476NZ	E CAPACITOR
	C704	NCT07CH-101A	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C705	ECEV1EV4R7R	E CAPACITOR
	OR	NEH31EM-475NZ	E CAPACITOR
	C706	NCB31HK-152A	CAPACITOR
	C707	ECEV1EV4R7R	E CAPACITOR
	OR	NEH31EM-475NZ	E CAPACITOR
	C708	ECEV1CV470P	E CAPACITOR

22. INDICATOR-2 BOARD ASSEMBLY <28>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20077E-01-C	IND-2 BOARD ASSY
	IC801	VC2085	IC
	IC802	M5M5256FP	IC
	OR	SRM20256LM	IC
	OR	UPD43256AGU	IC
	OR	UPD43256GU	IC
	OR	M5M5256BFP-LL	IC
	OR	M5M5256BFP-L	IC
	IC803	M54641FP	IC
	IC804	MN12821(QR)	IC
	Q801	2SA1532(BC)	TRANSISTOR
	D801	MA714	DIODE
	D802	MA141WA	DIODE
	D803	RD6.8ESB	ZENER DIODE
	R801	NVP1301-222N	V RESISTOR,TITLE OSC
	R802	NRSA63J-102N	RESISTOR
	R803	ERT-D2FGL601S	THERMISTOR
	R804	NRSA63J-121N	RESISTOR
	R805	NRSA63J-104N	RESISTOR
	R806	NRSA63J-104N	RESISTOR
	R811	NRSA63J-101N	RESISTOR
	R812	NRSA63J-101N	RESISTOR
	R813	NRSA63J-682N	RESISTOR
	R814	NRSA63J-472N	RESISTOR
	R815	NRSA63J-153N	RESISTOR
	R816	NRSA63J-103N	RESISTOR
	R820	NRSA63J-472N	RESISTOR
	R821	NRSA63J-225N	RESISTOR
	R822	NRSA63J-0R0A	RESISTOR
	R823	NRSA63J-0R0A	RESISTOR
	R824	NRSA63J-0R0A	RESISTOR
	R826	NRSA63J-0R0A	RESISTOR
	R828	NRSA63J-0R0A	RESISTOR
	R829	NRSA63J-471N	RESISTOR
	C802	QEF81CM-226	TANTAL CAPACITOR
	C803	NCT07CH-181A	CAPACITOR
	C804	ECEV1CV100R	E CAPACITOR
	OR	NEH31CM-106NZ	E CAPACITOR
	C805	ECEV0JV220R	E CAPACITOR
	OR	NEH30JM-226NZ	CAPACITOR
	C806	NCR21CM-473A	CAPACITOR
	C807	NCF31CZ-104A	CAPACITOR
	C812	NCB31HK-391A	CAPACITOR
	C813	YU40470-104	CAPACITOR
	L801	PU58201-120K	COIL
	L802	PU58201-120K	COIL
	SPC1	YQM30019-5	PAD
	SPC2	YQM30019-8	PAD

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	CN801	YU40105-12	CAP HOUSING (BOARD TO BOARD)
	CN804	YU40096-4	CAP HOUSING
	CN805	YU40096-2	CAP HOUSING

23. SWITCH BOARD ASSEMBLY <28>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20070A-01-C	SWITCH BOARD ASSY
	R901	QRSA08J-102YN	RESISTOR
	R902	QRSA08J-102YN	RESISTOR
	R903	QRSA08J-102YN	RESISTOR
	R904	QRSA08J-102YN	RESISTOR
	R905	QRSA08J-102YN	RESISTOR
	SW901	PU57008	TACT SWITCH
	SW902	PU57008	TACT SWITCH
	SW903	PU57008	TACT SWITCH
	SW904	PU57008	TACT SWITCH
	SW905	PU57008	TACT SWITCH
	CN901	YU40095-6	CAP HOUSING

24. H.DRIVER BOARD ASSEMBLY <30>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20112B-C	H.DRIVER BOARD ASSY
	Q1	2SA1610	TRANSISTOR
	Q2	2SC4176	TRANSISTOR
	Q3	2SA1610	TRANSISTOR
	Q4	2SC4176	TRANSISTOR
	D1	MA141WK	DIODE
	D2	MA141WA	DIODE
	R1	NRSA63J-220N	RESISTOR
	R2	NRSA63J-220N	RESISTOR
	R3	NRSA63J-220N	RESISTOR
	R4	NRSA63J-220N	RESISTOR
	C1	NCT07CH-470A	CAPACITOR
	C2	NCT07CH-470A	CAPACITOR
	C3	NCT07CH-470A	CAPACITOR
	C4	NCT07CH-470A	CAPACITOR
	C5	NCB31EK-103A	CAPACITOR
	C6	QEF81CM-226	TANTAL CAPACITOR
	C7	NCT07CH-470A	CAPACITOR
	C9	NCT07CH-680A	CAPACITOR
	L1	YU40248-101KY	COIL

25. DRUM BOARD <31>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWB	YDM3021-2	BOARD (UPPER DRUM)

26. LED BOARD <33>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWB	YB40001	LED BOARD
	D1	SIM-20ST	LE DIODE

* * *

27. END SENSOR <34>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PHS	TPS605	PHOTO TRANSISTOR

* * *

28. E.VIEWFINDER BOARD ASSY <50>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
⚠	PWBA	YU30181-015	E.VF BOARD ASSY
⚠	IC1	AN2512S	IC
	IC2	AN78L05	IC
	TR1	2SC2812	CHIP TRANSISTOR
		OR 2SD601A	CHIP TRANSISTOR
		OR 2SC2412K	CHIP TRANSISTOR
		OR 2SC2712	CHIP TRANSISTOR
		OR 2SC3052	CHIP TRANSISTOR
		OR 2SC2462	CHIP TRANSISTOR
⚠	TR2	2SD1665M	TRANSISTOR
⚠		OR 2SD774	TRANSISTOR
⚠		OR 2SC3665	TRANSISTOR
⚠		OR 2SD1815	TRANSISTOR
⚠		OR 2SD667A	TRANSISTOR
	D01	DCB010	CHIP DIODE
		OR DAN202K	CHIP DIODE
		OR MC2838	CHIP DIODE
		OR HSM2838	CHIP DIODE
		OR MA151WK	CHIP DIODE
		OR ISS184	CHIP DIODE
	D02	ERA15-06	DIODE
		OR RGP10G	DIODE
		OR DSA1B6	DIODE
	D03	MA152WK	DIODE
	D04	ERA15-06	DIODE
		OR DSA1B6	DIODE
		OR RGP10G	DIODE
	D05	DCB010	DIODE
		OR HSM2838	CHIP DIODE
		OR DAN202K	CHIP DIODE
		OR MC2838	CHIP DIODE
		OR ISS184	CHIP DIODE
		OR MA151WK	CHIP DIODE
	VR1	YU30181-502	V RESISTOR,V SIZE
	VR2	YU30181-503	V RESISTOR,H-HOLD
	VR3	YU30181-504	V RESISTOR,CONT
	VR4	YU30181-505	V RESISTOR,BRIGHT
	R01	QRSA08J-3R9	RESISTOR
	R02	QRSA08J-363	RESISTOR
	R04	QRSA08J-514	RESISTOR
	R06	QRSA08J-122	RESISTOR
	R07	QRSA08J-104	RESISTOR
	R08	QRSA08J-122	RESISTOR
	R09	QRSA08J-561	RESISTOR
	R10	QRSA08J-472	RESISTOR
	R14	QRSA08J-471	RESISTOR
	R15	QRSA08J-471	RESISTOR
	R16	QRSA08J-471	RESISTOR
	R20	QRSA08J-512	RESISTOR
	R21	QRSA08J-512	RESISTOR
	R22	QRSA08J-103	RESISTOR
	R23	QRSA08J-102	RESISTOR
	R24	QRSA08J-273	RESISTOR
	R30	QRSA188J-335	RESISTOR
	R31	QRSA188J-335	RESISTOR
	R32	QRSA08J-332	RESISTOR
	R42	QRSA08J-125	RESISTOR
	R51	QRSA08J-180	RESISTOR
	RX	QRSA08J-200	CHIP RESISTOR
	C01	YU30181-506	TANTAL CAPACITOR
	C02	QCYA1EK-223	CHIP CAPACITOR
	C03	QEK41HM-105	CAPACITOR
	C04	QEK41HM-225	CAPACITOR
	C05	QEK41CM-106	CAPACITOR
	C10	QEK41AM-107	CAPACITOR
	C11	QEK40JM-227	CAPASITOR
	C12	QEK41AM-107	CAPACITOR
	C20	QCTA1CH-161	CHIP CAPACITOR
	C21	QEK41HM-335	CAPACITOR
	C24	QCFA1EZ-333	CHIP CAPACITOR
	C30	QCF81CZ-105	CAPACITOR
	C31	QEK41HM-335	CAPACITOR
	C32	YU30181-507	CAPACITOR
	C33	PU59343	FILM CAPACITOR(1500P/400)
	L01	YU30181-509	H.L.C
⚠	CP	ICP-N10	C.PROTECTOR
⚠	FBT	YU30181-510	F.BACK TRANS
	CN1	PU58656-5	CONNECTOR
	CN2	PU58656-4	CONNECTOR
⚠	TF1	YU30181-508	THERMISTOR

SECTION 8
TECHNICAL INFORMATIONS

8.1 MECHACON CPU PIN FUNCTION

Pin No.	Label	IN/OUT	Note	
1	FADER REQUEST (⎍)	OUT		To IND
2	REC INDICATE (H)	OUT		
3	TAPE END (H)	OUT	From 2 minutes before tape end	
4	BATTERY ALARM (H)	OUT	When the supply voltage becomes 9.2 V	
5	BATTERY CHECK	IN	9.2 V (ALARM), 8.8 V (POWER OFF)	ANALOG INPUT
6	END SENSOR	IN	Detect the tape end	
7	MECHA DATA B	IN	Detect the mechanism condition	
8	MECHA DATA A			
9	KEY B	IN	Operation keys input	
10	KEY A			
11	TRIGGER SW ON (L)	IN		
12	FULL ERASE HEAD ON (H)	OUT		
13	TEST 1	IN	When both High : NORM mode When both Low : EMERGENCY OFF mode	
14	TEST 0			
15	COUNTER OE (H)	OUT	For LCD	
16	SERIAL CLOCK	IN		
17	SERIAL DATA	OUT		
18	FLYING ERASE HEAD ON (H)	OUT		
19	CAPSTAN FG	IN	BACK SPACE EDIT, TAPE END ALARM	
20	POWER SW ON (L)	IN		
21	FADER MODE (H)	IN		
22	TRIGGER ALARM (⎍)	OUT		
23	DRUM FF	IN	DRUM ROTATE DET, REC START TIMING, END LED ON TIMING	
24	GND	–		
25	RESET (L)	IN		
26	X IN	IN	4 MHz CLOCK OSC	
27	X OUT	OUT		
28	NC	–		
29	GND	–		
30	HEAD SW PULSE D	IN	REC START TIMING	
31	HEAD SW PULSE A			
32	CTL PULSE	IN	EDITING POINT DET	
33	SUPPLY REEL FG	IN	SUPPLY REEL ROTATE DET, TAPE END ALARM DET	
34	REMOTE	IN	SERIAL REMOTE PULSE INPUT from RM-V15	
35	NTSC (L)/PAL (H)	IN		
36	CAM B	IN	Detect the mechanism mode	
37	CAM A			
38	REC CTL PULSE DUTY	OUT	65% (H)/55% (L)	
39	CAPSTAN CONTROL	OUT	MECHACON (H)/SERVO (L)	
40	SEARCH (H)	OUT	MODE | PB | INSERT | ASB | REC	
41	SERVO MODE I	OUT	I | L | H | L | H	
42	SERVO MODE A		A | L | L | H | H	
43	AUDIO MUTE (H)	OUT		
44	AUDIO EE (H)	OUT		
45	PAUSE (H)	OUT		
46	AUDIO REC MUTE (L)	OUT		
47	CAMERA or PB (H)/EXT (L)	OUT		
48	DRUM ON (H)	OUT	After middle point	
49	RETAKE REW (H)	OUT		
50	COUNTER OPERATE (L)	OUT		
51	COUNT UP (H)/DOWN (L)	OUT		
52	VIDEO REC MUTE (L)	OUT		
53	VIDEO MUTE (L)	OUT		
54	VIDEO REC (L)	OUT		
55	VIDEO PB (L)	OUT		
56	END LED (⊔)	OUT	Pulse drive	
57	AFTER LOADING (L)	OUT	Mode control motor drive voltage up	
58	LOAD REV (H)	OUT	NORM L FWD L REV H BRAKE H	
59	LOAD FWD (H)		L H L H	
60	V. PULSE ON (H)	OUT	SEARCH or STILL (H)	
61	EP (H)/SP (L)	OUT		
62	REMOTE PAUSE (L)	OUT	For MASTER EDIT	
63	CAPSTAN REV (L)	OUT	CAPSTAN MOTOR DIRECTION CONTROL	
64	CAPSTAN FWD (L)			
65	GND	–		
66	POWER ON (H)	OUT		
67	Vcc	–		
68	GND	–		
69	NC	–		
70	CAP MOTOR REF	OUT		
71	NC	–		
72	CAMERA POWER ON (H)	OUT		

Table 8-1 Mechacon CPU pin function

8.2 DIGITAL SERVO LSI (IC101)

All the terminal functions of IC101 are listed here for reference in servicing.

MODE				Pin No.
REC	ASB	INST	PB	
H	H	L	L	1
H	L	H	L	2

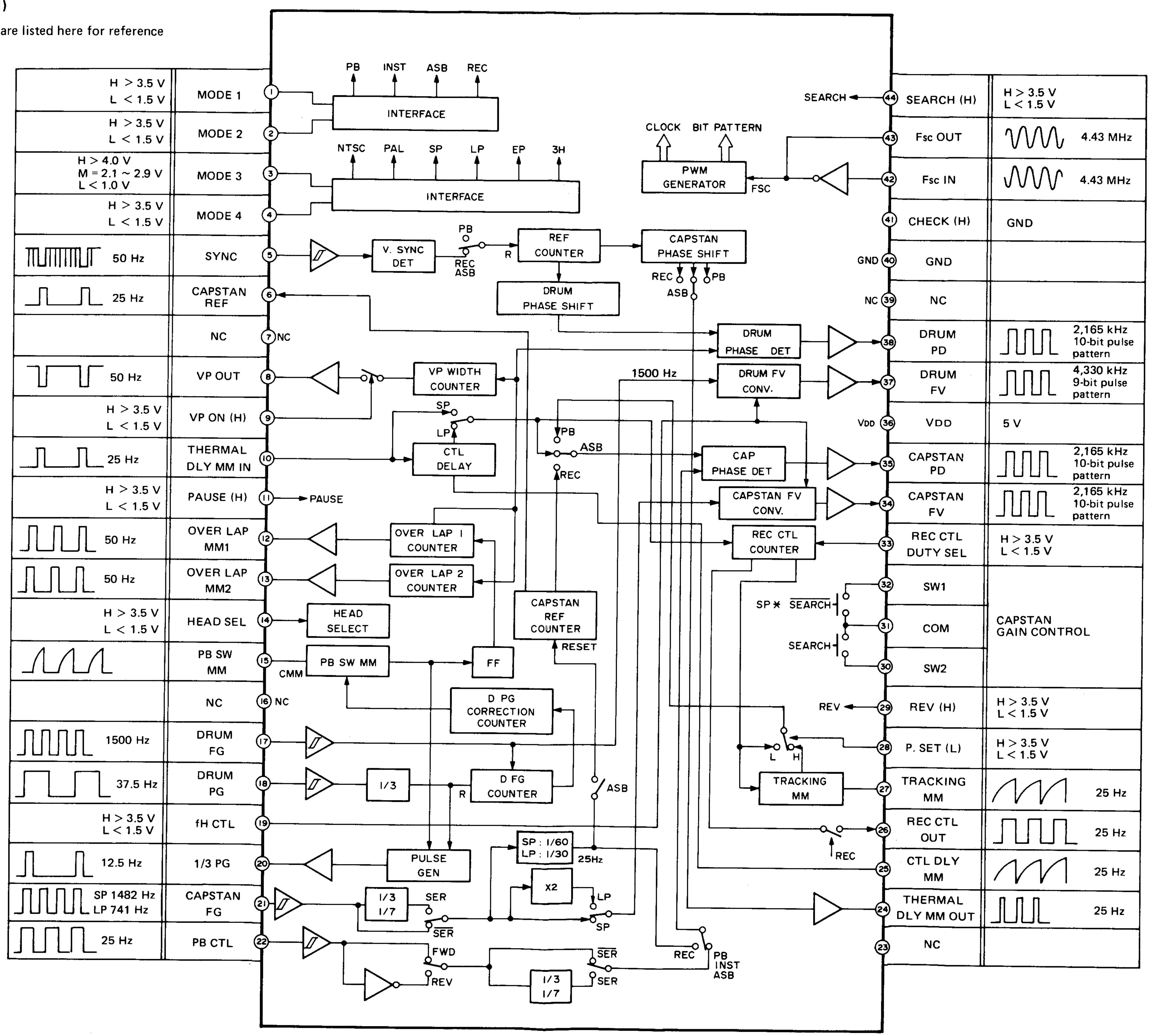
MODE						Pin No.
PAL		NTSC				
9H	3H	9H		3H		
LP	SP	EP	SP	EP	SP	
H	H	M	M	L	L	3
H	L	H	L	H	L	4

MODE		Pin No.
VP		
ON	H	9
OFF	L	

MODE		Pin No.
PAUSE		
ON	H	11
OFF	L	

MODE		Pin No.
HEAD SEL		
4 HEAD	H	14
DA 8	L	

MODE		Pin No.
FH CTL		
FH ON	H	19
FH OFF	L	


H > 3.5 V
L < 1.5 V
MODE 1
1
MODE 2
2
H > 4.0 V
M = 2.1 ~ 2.9 V
L < 1.0 V
MODE 3
3
MODE 4
4
50 Hz
SYNC
5
25 Hz
CAPSTAN REF
6
NC
7
50 Hz
VP OUT
8
VP ON (H)
9
25 Hz
THERMAL DLY MM IN
10
PAUSE (H)
11
PAUSE
50 Hz
OVER LAP MM1
12
50 Hz
OVER LAP MM2
13
HEAD SEL
14
PB SW MM
15
CMM
NC
16
1500 Hz
DRUM FG
17
37.5 Hz
DRUM PG
18
fH CTL
19
12.5 Hz
1/3 PG
20
SP 1482 Hz
LP 741 Hz
CAPSTAN FG
21
25 Hz
PB CTL
22
PB
INST
ASB
REC
INTERFACE
NTSC
PAL
SP
LP
EP
3H
INTERFACE
V. SYNC DET
REC
ASB
R
REF COUNTER
CAPSTAN PHASE SHIFT
DRUM PHASE SHIFT
CLOCK
BIT PATTERN
PWM GENERATOR
FSC
DRUM PHASE DET
DRUM FV CONV.
1500 Hz
VP WIDTH COUNTER
SP
LP
CTL DELAY
CAP PHASE DET
CAPSTAN FV CONV.
REC CTL COUNTER
OVER LAP I COUNTER
OVER LAP 2 COUNTER
CAPSTAN REF COUNTER
RESET
HEAD SELECT
PB SW MM
FF
D PG CORRECTION COUNTER
1/3
D FG COUNTER
PULSE GEN
SP : 1/60
LP : 1/30
25Hz
X2
1/3
1/7
SER
FWD
REV
1/3
1/7
SEAR
SP
LP
REC
PB
INST
ASB
SP✱ SEARCH
SEARCH
TRACKING MM
L
H
REV
SEARCH
SEARCH (H)
44
H > 3.5 V
L < 1.5 V
Fsc OUT
43
4.43 MHz
Fsc IN
42
4.43 MHz
CHECK (H)
41
GND
GND
40
GND
NC
39
NC
DRUM PD
38
2,165 kHz
10-bit pulse pattern
DRUM FV
37
4,330 kHz
9-bit pulse pattern
VDD
36
VDD
5 V
CAPSTAN PD
35
2,165 kHz
10-bit pulse pattern
CAPSTAN FV
34
2,165 kHz
10-bit pulse pattern
REC CTL DUTY SEL
33
H > 3.5 V
L < 1.5 V
SW1
32
COM
31
CAPSTAN GAIN CONTROL
SW2
30
REV (H)
29
H > 3.5 V
L < 1.5 V
P. SET (L)
28
H > 3.5 V
L < 1.5 V
TRACKING MM
27
25 Hz
REC CTL OUT
26
25 Hz
CTL DLY MM
25
25 Hz
THERMAL DLY MM OUT
24
25 Hz
NC
23

Pin No.	MODE	
	SEARCH	
44	H	SEARCH
	L	NORM

Pin No.	MODE	
	REC CTL DUTY	
33	H	65%
	L	55%

Pin No.	MODE	
	REV	
29	H	REV
	L	NORM

Pin No.	MODE	
	P. SET	
28	H	OFF
	L	ON

Fig. 8-1 Block diagram of IC101 with terminal functions

8.3 INDICATOR I/O

PIN No.	LABEL	IN/OUT	CONTENTS							
1	LLL	IN	Low : LOW LIGHT							
2	CHARACTER	IN	WHITE BALANCE indication (Low : CHARACTER, High : ALPHABET)							
3	NTSC/PAL	IN	Low : NTSC, High : PAL							
4	TAPE END	IN	High : TAPE END							
5	VIDEO REC	IN	Low : REC mode							
6	SP/EP	IN	High : EP, Low : SP							
7	VIDEO PB (L)	IN	Low : INDICATOR OFF							
8	ALC	IN	Not used	CL1	CL2	CL3	COLOR			
9	RESET (L)	IN		H	H	H	WHT			
10	SMTH CHARACTER 1	OUT	CHARACTER OUTPUT for Electronic Viewfinder	H	H	L	YEL			
11	FRINGE 1	OUT	Not used	H	L	H	CYAN			
12	FRINGE 2	OUT	FRINGE signal OUTPUT for DATE/TIME REC	H	L	L	GRN			
13	SMTH CHARACTER 2	OUT	CHARACTER signal OUTPUT for DATE/TIME REC	L	H	H	PURP			
14	CL 1	IN		L	H	L	RED			
15	CL 2	IN		L	L	H	BLUE			
16	STOP (L)	IN	High : CAMERA ON, Low : CAMERA OFF	L	L	L	BLK			
17	CANCEL (L)	IN	Low : FADER CANCEL							
18	CL 3	IN								
19	NC	–								
20	NC	–								
21	NC	–								
22	NC	–								
23	VD	IN	Vertical Drive Pulse							
24	HD	IN	Horizontal Drive Pulse							
25	VDD	IN	5 V							
26	OSC 1	IN	6 MHz							
27	OSC 2	OUT	6 MHz							
28	Vss 1	IN	GND							
29	Vss 2	IN	BACK UP GND							
30	Vss 3	IN	CLOCK GND							
31	X 1	IN	32 kHz							
32	X 2	OUT	32 kHz							
33	LAP RESET	IN	DATE UNIT	Low : REC TIME RESET button ON or CAMERA OFF						
34	TIME REC ON/OFF	IN		Low : DATE/TIME REC button ON						
35	REC SEL	IN		Low : DISPLAY SELECT button ON						
36	ADJUST SEL	IN		Low : SELECT button ON						
37	SET	IN		Low : DISPLAY SET button ON						
38	LAP ON/OFF	IN		High : LAP indication, Low : No LAP indication						
39	12H/24H	IN	High : 24H indication, Low : 12H indication							
40	DATE 1	IN	DATE SELECT	1 : Low, 2 : Low 60 . 12 . 17 PM 3 : 30	1 : High, 2 : Low 17 . 12 . 60 PM 3 : 30	1 : High, 2 : High 12/17 . 60 PM 3 : 30	1 : Low, 2 : High DEC. 17 : 60 PM 3 : 30			
41	DATE 2	IN								
42	IND (H)	IN	"FADER" BLINK							
43	MODE 1	IN	W.BAL.MODE FEEDBACK	1 : Low, 2 : Low INDOOR	1 : Low, 2 : High FL	1 : High, 2 : Low OUTDOOR	1 : High, 2 : High (AUTO)			
44	MODE 2	IN								
45	FULL AUTO	IN	Low : FULL AUTO button ON							
46	WHITE BALANCE	IN	Low : WHITE BALANCE SELECT							
47	FOCUS	IN	Low : FOCUS button ON							
48	SHUTTER	IN	Low : SHUTTER button ON							
49	FADER	IN	Low : FADER button ON							
50	P1	IN								
51	FADER	OUT	High : FADER reserved							
52	NC	–								
53	NC	–								
54	SHUTTER 1	OUT	SHUTTER MODE SET	1 : Low, 2 : Low STANDARD	1 : Low, 2 : High 1/250	1 : High, 2 : Low 1/500	1 : High, 2 : High 1/1000			
55	SHUTTER 2	OUT								
56	WBO 1	OUT	W. BAL. MODE SET	1 : Low, 2 : Low INDOOR	1 : Low, 2 : High FL	1 : High, 2 : Low OUTDOOR	1 : High, 2 : High AUTO			
57	WBO 2	OUT								
58	AUTO FOCUS	OUT	High : AUTO FOCUS							
59	NC	–						P 1	P 2	Page
60	P2	IN	▶■◀	◀	▶	■		L	L	P 1
61	FRONT FOCUS	IN	H	H	L	H		H	L	P 2
62	CENTER FOCUS	IN	H	H	H	L		L	H	P 3
63	BACK FOCUS	IN	H	L	H	H		H	H	P 4
64	BATTERY	IN	High : BATTERY ALARM							

Table 8-2 IND controller pin functions

ELECTRONIC VIEWFINDER DISPLAY	LABEL / IC301 PIN NO.	BLINK (2 Hz)	BLINK (1 Hz)	CAM EE	IND	FAD 0	SHUTTER 2	SHUTTER 1	LAP	SP/EP	V. REC	TAPE END	NTSC/PAL	CHARACTER	WBO B	WBO A	LLL	BATTERY	AUTO FOCUS	FRONT FOCUS	CENTER FOCUS	BACK FOCUS	P2	P1	CL3	CL2	CL1
		—	—	7	42	51	55	54	38	6	5	4	3	2	57	56	1	64	58	61	62	63	59	63	18	15	14
FOCUS	■			H															L	H	L	H					
	▶			H															L	H	H	L					
	◀			H															L	L	H	H					
	▶■◀		○	H															L	H	H	H					
	(AUTO)			H															H								
– BATTERY –			○	H														H									
LIGHT			○	H													L										
W. BALANCE	💡			H										L	L	L											
	▭			H										L	H	L											
	☀			H										L	L	H											
	INDOOR			H										H	L	L											
	FL LAMP			H										H	H	L											
	OUTDOOR			H										H	L	H											
	(AUTO)														H	H											
DECK MODE	REC			H						H	L	L															
	—			H						H	H	L															
	REC	○		H						H	L	H															
	EP REC			H						L	L	L	L														
	EP —			H						L	H	L	L														
	EP REC	○		H						L	L	H	L														
	LP REC			H						L	L	L	H														
	LP —			H						L	H	L	H														
	LP REC	○		H						L	L	H	H														
LAP	1 : 23 : 45			H					H																		
FADER	FADER			H		H																					
	FADER	○		H	H	H																					
SHUTTER	S1000			H			H	H																			
	S500			H			L	H																			
	S250			H			H	L																			
	(STD)			H			L	L																			
SUPERIMPOSE	P1																						L	L			
	P2																						H	L			
	P3																						L	H			
	P4																						H	H			
	WHT																								H	H	H
	YEL																								L	H	H
	CYAN																								H	L	H
	GRN																								L	L	H
	PURP																								H	H	L
	RED																								L	H	L
	BLUE																								H	L	L
	BLK																								L	L	L

Table 8-3 Electronic viewfinder display

SECTION 9
SERVICE GUIDE

9.1 EMERGENCY MODE TABLE

Display (Flash)	Symptom	Mode when observed	Resulting mode
▶▶	P.B. CTL pulse input absent	During Zero Frame Editing	STOP
◀◀	–	–	–
▶ ▶▶	Drum flipflop input absent	Drum rotation, Zero Frame Editing	STOP
◀◀ ▶	Reel sensor input absent	PB, REC, SEARCH FF	STOP
▶II	Loading motor rotates for more than 10 sec without shift to next mode	Loading, Unloading	Mode continues

Emergency mode : Indication for 5 minutes, then power OFF (power not turned OFF when using AC adapter)
Port states : Same as Stop mode
Effective key : POWER
Shifted mode : Power OFF
No. 6 : Emergency shut-off can be used for short test, etc.
Emergency input is "H" at EMG terminal.
Power OFF in all modes and all I/O are initialized.